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ROCKS and MINERALS

Vol. 6. No. 2. JUNE, 1931 Whole No. 20

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OPEN CUT OF THE ARKANSAS DIAMOND CORPORATION MINE
NEAR MURFREESBORO, ARKANSAS

Featured in This Issue

On Collecting Sands.
By Prof. Harold Orville Whitnall.

Famous "Rolling Rock" Saved From Destruction.
By James G. Manchester.

The Malachite of White Plains, N. Y.
By Thomas W. Fluhr, A. M.

Are the "Good Old Days of Mineral Collecting" Gone?
By Morrell G. Biernbaum, B. S., C. E.

A NON-TECHNICAL MAGAZINE
—ON—
MINING - PROSPECTING - GEOLOGY - MINERALOGY

THE BULLETIN BOARD

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AN APPRECIATION

Through the courtesy of Mr. James G. Manchester of Scarsdale, N. Y., one of our esteemed subscribers and friends, it is our happy privilege to reproduce in ROCKS AND MINERALS sixteen photographs from his excellent book—"The Minerals of New York City and Its Environs" which was issued recently by the New York Mineralogical Club. These photographs will be found on pages 63-70 inclusive and are only a small fraction of the very fine illustrations of notable minerals or localities appearing in Mr. Manchester's book. A limited number of copies of the book are for sale and we would urge every one interested to send in their order while the supply lasts. A coupon will be found in the front part of this magazine for your convenience.

A CORRECTION

In the March issue, page 30, second column, first paragraph, the last line reads: "If containing selenium, it will emit a strong odor of decayed horse-flesh." The last word should be "horse-radish."

OUR FIFTH ANNIVERSARY NUMBER

The September, 1931 issue will be our Fifth Anniversary Number and we hope to commemorate this event with a larger and more attractive number than any that has yet made its appearance.

In Memoriam

The following friends of ROCKS AND MINERALS have left this earth on the long journey to that far distant country from which no traveler returns. May their journey thither be from one blessing to another and their arrival be marked by the rich rewards vouchsafed those who live this earthly life well and in the fear of God.

Albert C. Bates of Newark, N. J., died suddenly May 5th. A brief sketch of his life appears elsewhere in this issue of the magazine.

Rev. Thomas C. Crosby of Hebden, Yorkshire, England, (formerly of Sambro, Nova Scotia) died suddenly January 27th at the age of 66.

Dr. Robert Beder of Cordoba, Argentina, died Nov. 19, 1930.

Herman L. Willig of Lancaster, Penn., died April 23rd at St. Joseph's Hospital in Lancaster.

WANTED: Correspondents in all parts of the world who will be kind enough to send us notes and news items on minerals, etc., that they think may be interesting to the subscribers of ROCKS AND MINERALS. Such as are available we shall be very glad to print in the magazine.

ROCKS and MINERALS

A NON-TECHNICAL MAGAZINE
—ON—
MINING—PROSPECTING—GEOLOGY—MINERALOGY

Published Quarterly

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ROCKS AND MINERALS PEEKSKILL, N. Y., U. S. A.

The Official Journal of the Rocks and Minerals Association

Are You Short of Cash?

If so, you need not be ashamed of it these times as you are in good and extensive company. What we want to get at however is this: are you postponing subscribing or renewing your subscription to **Rocks and Minerals** because of the lack of ready cash? If such is the case, maybe we can do something about this. No doubt you have access to some local mineral deposit or may have good duplicates. If so, send us specimens that will make a fair retail value of Two Dollars. If acceptable, we will then send the Editor our check for a years subscription for you. Perhaps this looks to you as a 100% profit proposition for us. Let us assure you that the mineral dealing business does not work out this way. What with recording, labeling, postage and handling expenses, printing of price lists or approval service and other expenses, together with certain unavoidable losses and the fact that it may be a year or more before we get our money out of many of the specimens, if we show a few cents profit on a deal it will be all that we hope for and more than we expect. In fact, we would prefer that those who can spare the cash for subscription pass this offer up but if short of cash you are welcome to make use of the offer. You will get a regular cash receipt from the Editor for your own or gift subscription.

We are limiting this offer to one year for yourself or as a gift to some organization, school, library or friend and limiting the time to three months after the June 1931 issue of **Rocks and Minerals** is in distribution. Then if the plan works out to the satisfaction of everyone concerned we will most likely renew the offer.

Now there is no reason for you doing without the next four banner issues of **Rocks and Minerals**. Only remember that material without proper name and locality will be rejected and that we prefer if possible a smaller quantity of good material than a larger amount of cheaper specimens and that they must possess a full and fair $2.00 retail value.

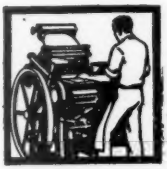
THE GEM SHOP

Box R37 **Wolf Creek, Montana**

ROCKS and MINERALS

Edited and Published by Peter Zodac

PUBLISHED QUARTERLY



JUNE 1931

On Collecting Sands

—*By*—

HAROLD ORVILLE WHITNALL

Professor of Geology, Colgate University
Hamilton, N. Y.

Collecting is an avocation appearing early in man's history and is shared today by primitive and civilized man. Often it is done to satisfy man's vanity and to serve as a vulgar display of wealth. Happily such incentives are rare. Among cultured people the great majority collect for the purpose of enlarging their own boundaries of knowledge and to enrich the field in which their interest lies.

The earnest collector is not, or at least should not, be content with a mere display no matter how attractively it may be arranged, labelled, and classified. His collection should serve as a base from which he may sally forth to forage in related fields.

A coin collector may have in his cabinet a Roman aureus with the imperial head of Caesar stamped upon it. If he is just a collector of coins, the aureus is but one of a number of ancient gold coins, possessing a certain monetary value and representing a rather remote date. But if the collector is also a student, this coin should lead him to a survey of Roman history, should interest him in the social and economic conditions of those times, cause him to investigate the source of the metals in the coin, and perhaps the profile of Caesar Augustus might arouse interest in Roman art.

Thus the mineral collector may have two objectives; one to amass a great number of minerals selected for their beauty and rarity, another to utilize this accumulation as a foundation for the study of the allied sciences, as geology and chemistry, and from it learn the importance of these minerals in the arts and industries.

Minerals have played an important part in the advancement of civilization and in this day of marvelous inventions and scientific progress their role is most conspicuous. Chemical processes, progress in physics, the rapid advancement of the electrical industry ,and the modern intensive studies of soils, demand a knowledge of minerals and their properties.

Many who are interested in minerals and rocks do not have the opportunity to visit mineral localities and thus, too often, reluctantly conclude that they must relinquish a pursuit which, if they had time and money, would delight them. To such, a fascinating field lies almost at their feet, for often the very ground they tread is a veritable mineral museum For one of the most abundant substances in the inorganic world is sand. Perhaps because of its very ubiquity it has been neglected as a subject of interest to the

amateur mineralogist, and yet a handful of sand contains many stories of earth's history if one is patient enough to read. Sands are the plebians of the mineral world but like common people they present a more complete cross section of their world than their more aristocratic associates.

A collection of sands lures one in a number of directions. They may be studied from their mineral content, their mode of origin, or their usefulness to man. The later phase is far greater than is generally realized, for the uses of sands are multitudinous and are increasing.

Though sand is a term usually employed to indicate an aggregate of small grains of quartz, this is a definition which has so many exceptions that it is better to define sand as a natural accumulation of small irregular particles or grains of various minerals ranging in size from 0.01 mm. to 2.5 mm. in diameter.

These grains are fragments of rocks and minerals which have been separated from their parent masses through weathering and erosion. Changes of temperature, chemical agents, the insiduous prying of the rootlets of plants, winds, running waters and waves breaking against a coast are some of the major forces which have been attacking the earth's crust since the world was formed.

Under the varied attack of the atmosphere with its water and carbonic acid content, some minerals, susceptible to solution, are dissolved and carried away as invisible constituents of waters. Others are decomposed into hydrous compounds and break down into implacable clay. But many, because of their resistance to solution and decay, retain their original composition and are merely broken into fine grains by the forces which assail them. These resistant minerals form the sands of the world. Cracked by temperature changes, tossed hither and yon by the winds, worn by running waters, ground by glaciers, and abraded by the ever restless waves gnawing against the coast, these fragments of minerals and rocks lose their size but never their identity.

Veterans, as they are, they bear the scars of battle and he who will may learn from these the weapons used in attack. For each sand grain not only manifests its mineral origin but tells of the forces that shaped it.

No attempt is made in this short article to discuss in any detail the complicated history of sand grains. A few general statements with illustrations must suffice. But it is hoped that they may be of interest to many collectors and may spur some on to collect this most common type of unconsolidated rocks and thus lead them into a field which, perhaps because of the very abundance of material has been woefully neglected.

As a basis for a sand collection we may consider sands from the standpoint of their geological history. First, naturally, would be those fragments which have been broken from the original mineral by the agents of weathering and have subsequently suffered no transportation or erosion. Such sands are called residual and their shapes are governed by the natural fracture or cleavage of the minerals from which they have been derived.

Such sands may be sought in regions of igneous rocks which have become weathered and whose fragments have remained in place. Take a typical granite; its quartz minerals will supply sharp and highly irregular grains; the feldspar particles will show some smooth surfaces because of the cleavage in the original feldspar crystals. Mica grains will also show cleavage faces with highly roughened edges. Many of the accessory minerals, as apatite and zircon, might yield well formed crystals.

If these sands have been weathered to a great extent they may show corrosion, staining and a dense clouding of the more transparent minerals. Fig. 1 illustrates a much weathered but non-eroded residual sand from diabase. The grains are sharply angular and coated with clayey material.

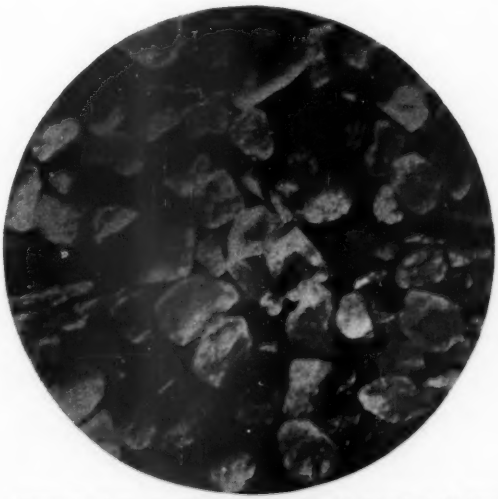
When a sand grain is transported from its place of birth the erosion attendant upon its transportation tends to smooth the initially angular mineral chip and round off its irregularities. The theoretical end product of such erosion would be a well rounded grain. But for various reasons such perfectness is seldom reached. Furthermore the medium of the agent of transportation and the distance the grain has travelled profoundly affects the rounding of the fragment.

The chief agent of transportation being running water, river borne sands are exceedingly common. The study of such sands is of much interest, particularly if

Courtesy of W. H. Sherzer, State Normal School of Michigan.

FIG. 1.

Residual Sand from Diabase, Medford, Mass.



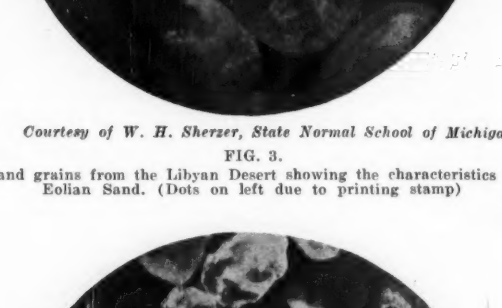
Courtesy of W. H. Sherzer, State Normal School of Michigan.

FIG. 2.

River sand from the mouth of the Tiber, Italy, showing angular and sub-angular grains.

Courtesy of W. H. Sherzer, State Normal School of Michigan.

FIG. 3.
Sand grains from the Libyan Desert showing the characteristics of Eolian Sand. (Dots on left due to printing stamp)



Courtesy of W. H. Sherzer, State Normal School of Michigan.

FIG. 4.
Beach Sand from Lake Michigan.

the sources of the grains are known. All things being equal, the distance travelled is the determining factor in the shaping of sand grains of hardness and durability, as quartz, garnet, magnetite, etc. On the others hand mineral particles of feldspar become eliminated after a long journey in the water because of their tendency to break down in decay when attacked by the agents of decomposition.

Hence if one finds angular sand grains together with minerals of easy decomposition, as feldspars and mica, one may be reasonably certain that the source rock of such ingredients is not far away. On the other hand well rounded fragments of quartz and an absence of the softer materials point to transportation over a considerable distance. River sands therefore vary much in their composition and shape. Fig. 2, shows sand grains of the River Tiber near its mouth. These are angular particles showing but little wear. As the river Tiber is a comparatively short river this condition would be expected.

Wind blown, or eolian sands, often reach a high degree of roundness as well as fineness. These features are due to the constant impact of the grains upon one another, for while they are being blown through the air, many collisions take place. Impacts of grain upon grain tend to split them into small pieces and finally reduce the finest fragments into well rounded grains. Furthermore the incessant impact, while they are in the air or being pushed along the ground, produces a frosted face on the sand grain as well as causing pitted surfaces. The dulled exterior is retained unless the grains are subsequently modified by solution. Fig. 3, is a group of sand grains from the Libyan Desert. They show rounding, frosting, and the "pits" which are often developed when the fragments smash against one another.

Next to wind blown sands in attaining a degree of roundness are beach sands. In the first place a large proportion of them have been brought by rivers, often from long distances. During these journeys the grains have become less and less angular. The constant abrasion or rubbing of them against one another and over the rocky beds of the streams have rounded their edges. After they reach the sea they are washed back and forth by the tides and surf and further worn. However the wear on the beach is not always as severe as it might seem, for each grain is surrounded by a thin film of water which acts as a cushion protecting the grains from direct abrasion. The general shapes of beach sands are shown in Fig. 4.

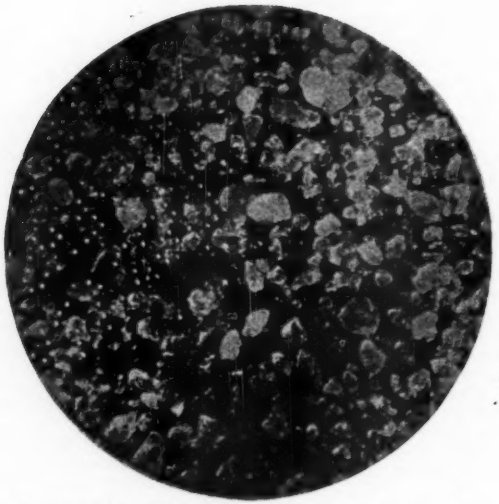
Glacial sands are of much interest, especially over the northern portion of the United States where they have been spread over the land by the swift streams which issued from the melting front of the great continental ice-sheet. They are very angular in form and represent residual soils picked up by the glacier in its southward advance, carried long distances as material frozen within the ice and released when the ice melted. Their original angularity is thus preserved, for, with few exceptions, they have not been subjected to erosion of abrasion, and encased within the ice, have been protected from the agents of weathering. In Fig. 5, the general shapes of glacial sand grains are shown.

If sands had merely passed through only one of these phases of erosion and transportation their history could be read with a great deal of accuracy. But it is evident that most sands have been subjected at one time or another to more than one type of erosion. For example; a beach sand usually has been worn by river action before it reached the sea as well as by the waves since its deposition along the shore line. Or again sea sand may be picked up by the winds and blown inland forming the eolian sands of the ever shifting dunes. Yet in spite of the multiple history that some sands may have the figures here represented may serve as ideal types.

It is best for the beginning student of sands to select carefully his first specimens. That is, be sure of the localities from which they came, and satisfy himself that they are typical of the five types described. Familiarizing himself with these types he will soon be able to classify sands from an unknown source.

A collection of sands displayed according to their shapes and origins is most instructive and may become extensive when one arrives at the point where it is possible to determine and sort sands having a varied history, as eolian-fluvial, fluvial-marine, glacial-eolian, glacial-fluvial, etc. However such a collection should serve as but a part of general sand display.

Another suggestion in collecting sands is to gather them from a mineral standpoint. There are a very great number of



Courtesy of W. H. Sherzer, State Normal School of Michigan.

FIG. 5.
Glacial Sands from the Mer de Glace, Switzerland, showing sharp angular and uneroded fragments.
(Dots on left due to printing stamp)

mineral fragments which form sand. To enumerate them all would be like indexing a book on mineralogy. But to show the possibilities we may suggest some of the minerals that occur quite frequently as sand grains.

Quartz	Zircon
Ilmenite	Augite
Magnetite	The Feldspars
Garnet	The Micas
Rutile	Apatite
Calcite	Hornblende
Monazite	Tourmaline

Inasmuch as few sands are entirely composed of one mineral it is difficult to obtain pure sands. From the student's standpoint this is fortunate for there would be but little intellectual incentive to merely collect and display bottles each containing a sand of a distinct mineral species. The real thrill comes from the examination of sand containing many different mineral grains and in determining the various kinds and their relative abundance.

This is not always easy and the amateur must not become discouraged when he first attempts this task. After some study he will be able to identify a surprisingly large number.

As in every collection the manner in which the sand is displayed enhances its appearance and serves as an inspiration to the collector. The general plan, however, should be left to the ingenuity of the collector as individuality and self-expression are arts which have been sadly neglected in this age of mass production. Yet after this general remark the writer, with that inconsistancy which marks human nature, would suggest that collections of sands be displayed in a two-fold way; in bulk and on glass sides for magnification or microscopic study. There are a number of ways of using slides but the one which is best adapted for the study of the shapes and kinds of sands is the use of glass slides of the design shown in Fig. 6. Be sure that the bottom of the depression is flat. Sprinkle the bottom with sand and seal with a cover glass. Do not put in too much

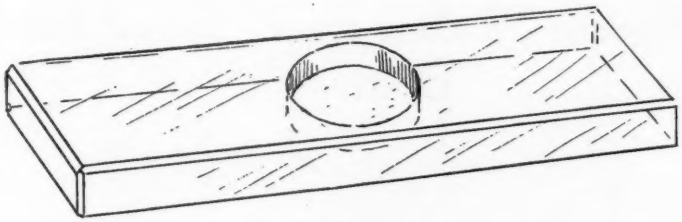


FIG. 6

Drawing of a glass slide suitable for observing sand grains either through a microscope or magnifying glass.

sand, just enough to permit a free movement of the grains so that by gently shaking all faces of the individual grains may be studied.

It is hoped that this very sketchy outline of the study of sand grains may be of enough interest to lead mineral and rock collectors into a field which has unlimited possibilities and is full of geological lore.

The Passing of a Noted Mineralogist

ALBERT C. BATES

The noted mineralogist, Mr. Albert C. Bates, died at his home, 320 Roseville Avenue, Newark, N. J., on Tuesday, May 5th, in the 75th year of his age. Funeral services were held at his late residence on Thursday evening, May 7th. The burial was in the family plot in Mt. Pleasant Cemetery on Friday.

The deceased lost his wife and son a few years ago. He is survived by a sister, Mrs. Anne Bates Mitchell, of East Orange, N. J., and a daughter-in-law, Mrs. Richard F. Bates, who resides at the Roseville Avenue address.

Mr. Bates passed away after an illness of only three days of pneumonia. For some years his health has been failing.

He was born in Providence, R. I., but has resided in Newark for over fifty years. Until his retirement a few years ago, he was in the hardware business in New York.

One of Mr. Bates main interests was the collection of minerals and he specialized in collecting and studying quartz. His contributions to the science of mineralogy are extensive and he was recognized as an expert.

The deceased was elected to membership in the Newark Mineralogical Society on February 6, 1916, at the Fifth meeting of that society. A few years ago he was elected to honorary membership because of his long service to the society and his standing in the mineralogical field.

H. L. T.

Famous "Rolling Rock" Saved from Destruction

—— *By* ——

JAMES G. MANCHESTER

The Rolling Rock, unique and grand,
Was snatched from dynamiting hand.
Bold symphony in equipoise
Is saved for earnest girls and boys.
Fond Mecca of school pilgrimage;
Proclaim its value, guess its age,
And when you show your friends the town
Pause at this boulder of renown.
In magnitude its stands alone,
Divine the sermon in this stone.
Recite its story, tell its worth,
Grim master-piece of mother earth.
Its tilting grace none can disprove,
Gibraltar that a child can move.

Famed Plymouth Rock was loved and kept;
Will Troy her Rolling Rock accept?*
The die is cast, it shall remain
Where nature placed it, long to reign
In its own park on primal throne,
An honored, awe-inspiring stone.
—J. Edmund Estes.

Located at the junction of County Street and Eastern Avenue in the easterly section of Fall River, Massachusetts, is the famous Rolling Rock. The rock foundation in Fall River is granite. The Rolling Rock is a coarse conglomerate, or puddingstone, which has been brought to this spot by glacial action and deposited by the slowly melting ice upon a granite base which had previously been smoothed down by the glacier. The contrast in the two rocks increases the interest with which the Rolling Rock is regarded. Its horizontal circumference is 58 feet and its medium perpendicular thickness is eight feet. Its weight is estimated to be 140 tons. There is abundant evidence that the Rolling Rock was a rockingstone up to quite recent times for it is so recorded in books relating to this subject, wherein it is recited that by the use of both hands it could be rocked so as to oscillate at the top two or three inches. Small stones and other material at the base act as wedges, thereby preventing such a demonstration at this time.

With the entry of the automobile as a mode of transport, the old rock, jutting into a narrow street, was considered to be a menace by some people, while others looked upon it as a remarkable natural monument which must be preserved. For twenty-five years it has been a subject of contention between these two forces. The matter was finally brought to a head when the city government ordered its destruction. Men and tools arrived on the scene but friendly Court proceedings held up the work temporarily. The local newspaper, the HERALD-NEWS, took up the fight to save the rock and brought it to a successful conclusion. Much interest was aroused and contributions came from people in all walks of life, societies and clubs participated, and the school children sent in their pennies to the fund. Mr. J. Edmund Estes, who had struggled for many years in an endeavor to save the rock, purchased the land upon which the rock rests at a cost of $6,000 and donated it as his contribution, the public subscriptions paying for the grading and curbing. On November 26th, last, the Rolling Rock and the little park that encloses it were formally dedicated and presented to the city in the presence of over 2,000 people. The exercises consisted of songs by the school children, band music, and a number of appropriate speeches. Now that the rock has been set aside for all time as a natural monument in such a beautiful setting everybody is pleased. The people of Fall River are to be congratulated upon their civic pride in preserving this remarkable geological wonder which has been the Mecca for years of those who enjoy visiting scenes that illustrate the powerful forces of nature such as is expressed in the Rolling Rock.

*The old name applied to the territory now known as Fall River.

Photo by Walt Coolidge

THE ROLLING ROCK, FALL RIVER, MASS.

Inscription on bronze plate: "Deposited on this spot during the glacial period ages ago. Unique in its tilting feature it is recognized as of great historic and scientific interest. Preserved by the public in the year 1930."

Mr. and Mrs. Frank W. Wilson of Meriden, Conn., recently exhibited fifty-six cabinet specimens in one of the store windows in their city. These specimens were from their collection and created much interest and favorable comment from those who were fortunate in viewing them. As an added attraction, their copy of the March issue of ROCKS AND MINERALS was also prominently displayed and a number of new subscriptions were obtained for us. We wish many more of our subscribers and friends were to display their minerals in a similar way; it might be the means of starting off many new collectors.

Hafnium—by Paul M. Tyler. An 11-page pamphlet on this interesting element has recently been issued as Information Circular 6457 by the U. S. Bureau of Mines, Washington, D. C.

During 1930, Utah ranked first in the United States in the production of silver, third in copper after Arizona and Montana, and third in lead after Missouri and Idaho.

Burning of Precious Stones: Electrical furnaces for this purpose are manufactured by Heraeus & Co., (Electrical Department) Hanau, Germany.

The Malachite of White Plains, N. Y.

—*By*—

THOMAS W. FLUHR, A. M.

Copper minerals have been found in the past at White Plains, N. Y., and are reported by James G. Manchester in his recent book, "The Minerals of New York City and its Environs". Occurrences of copper minerals in this locality are however, quite rare, and when I was informed that a deposit of malachite and azurite had been reported in a road cut in the vicinity of White Plains, I was glad to avail myself of the opportunity of visiting the deposit. The vein was discovered by Mr. L. R. Stuffler, Superintendent of Construction of the Westchester County Park Commission, and was uncovered during the construction of the Central Westchester Parkway. The deposit is situated near the Greenburg school, and about a half mile from the County Center Building. Mr. Stuffler, whose experience in the mining area of Bisbee, Arizona lead to the recognition of the deposit, reported the presence of both malachite and azurite, but by the time I reached the deposit all the azurite was gone.

The country rock in which the deposit is found is Fordham gneiss. The gneiss ridge at this place has been cut through in the process of road construction, and but for this the deposit would not have been found. The gneiss is dark in color, much darker than typical Fordham gneiss, and a thin section shows that it is very largely made up of hornblende, and carries but little quartz and feldspar. Throughout the rock are little grains of magnetite, introduced from an outside source.

Immediately in the vicinity of the malachite the gneiss has been penetrated by a pegmatite. Well-formed orthoclase crystals are found in this, and numerous octahedra of magnetite. Because of movement in the rock at some time after the pegmatite had entered it, almost all the crystals are cracked and it is difficult to secure good specimens. The pegmatite was undoubtedly the source of the magnetite found introduced into the country rock. A joint in the gneiss, just above the pegmatite, has been partly filled with a quartz stringer from the pegmatite, and just above this quartz, and in the joint, the malachite is found. In the hope that some light might be shed on the origin of the malachite, a polished surface of a piece of the more

The jointed condition of the rock and the pegmatite intrusion are apparent; the malachite is just above the hammer.

substantial part of the deposit was made.

The polished surface shows a rock made up of hornblende with a little quartz and feldspar. Into this has been introduced a large quantity of magnetite. Movement has taken place in the rock, and it contains numerous fine cracks and fissures. In these the malachite is found.

It would appear that the copper has been carried down into the previously fractured rock by circulating waters of surface origin and there deposited. It is therefore of secondary origin.

Exchange of Mineral Specimens

It is not easy to exchange minerals with remote and often personally unknown collectors. The main difficulty is in the great diversity of the specimens, their condition, size and rarity, which determines their value. Rarely are two pieces, even from the same locality, exactly alike. But with a little patience and labor these difficulties can be mainly overcome and result in a satisfactory exchange for both parties. Remember that your correspondent does not see your specimens, therefore a short description will be required, giving the name, locality, approximate size, condition of the specimen, whether crystallized, massive, mixed, earthy, polished slab, grains, small loose crystals, amount of mineral in specimen, etc., etc., for an intelligent estimate.

Mineral specimens have value, even those that can be found abundantly at their locality, require time, labor, traveling expenses and mail or express transportation.

The better and rarer pieces will generally have to be bought at the quarries or mines, some have to be cut or polished to show their beauty, others like gold, silver, etc., have a high commercial valus . Rare minerals, very beautiful pieces and those from exhausted localities naturally have an increased value.

Though some specimens may be presented, it does not follow that they are worthless, otherwise they would be a poor present. Therefore it is just that a fair value should be placed on each piece, taking all conditions into consideration.

The exchange of minerals is a commercial transaction and should be done in a business like manner. It is evident that a man who sends out ten one dollar specimens has no use for one hundred ten cent specimens in return. A bargain is never a good bargain unless both parties are benefitted by it.

In regard to size, it is evident that if a piece 2"x3" is worth a certain price, then a piece 3"x4" is worth double, and a piece 4"x6" quadruple that amount. This principle is well recognized in the catalogues of the mineral dealers.

The sizes of specimens are of course only approximate and generally indicate the smallest size tray required for the specimen, but they help to distinguish between blowpipe chips, cabinet and museum pieces.

In regard to the return shipment, the first sender is under a disadvantage, but let him have full confidence in his correspondent. Nine times out of ten the latter is also desirous to dispose of his duplicates and will give a fair return from his stock, according to his best judgment, though he cannot be expected to send any definite species unless he has them.

Thus with a mutual desire to help each other, the collections can be improved without more cost than that of transportation and required correspondence.

Almost every collector has many specimens too small or poor to be offered in exchange. These should be given to the school boys or Boy Scouts, who are interested, because they are the ones who will have our private collections sooner or later and will be better able to appreciate and enjoy the great collections in our museums.

O. F. PFORDTE.

Cairo, Green Co., N. Y.

Are the "Good Old Days of Mineral Collecting" Gone?

—— *By* ——

MORRELL G. BIERNBAUM, B. S., C. E.

My purpose here is to analyze the title of this article, and further to give collectors a little knowledge of actual conditions at a few famous collecting localities.

When we go to see mineral collections at museums and private homes, we invariably see marvellous specimens from more or less specific localities such as Nova Scotia, Franklin, Joplin, Renfew, Hull, Bergen Hill, and Bisbee, all from this continent, and Poonah, Nizhni Tagilsk and others from abroad. Many collectors feel that these were names to conjure with in the dim past, gone forever. Others feel that if they could but visit these "places", that they could probably duplicate all of the specimens they have seen. Others again regret that they did not happen to live at the time these localities were pouring forth fine specimens. A little honest analysis of the real facts of the situation as affect us today is therefore not amiss.

It is often said that "they were the grand old days for collectors". This is not exactly a true statement, because it is a common fault of human nature to group the hundreds of years of past history together when comparing with the few years of the present. There was never a time when MANY famous localities were producing specimens AT THE SAME TIME. Today, as bad as it looks to some collectors, we have, as fine producing localities, such names as Joplin, Mo., Paterson, N. J., Nova Scotia and the Chihuahua, Mexico, district of lead mines on this continent, and Tsumeb, Katanga, and Minas Geraes abroad. One cannot forsee the advent of a new great locality which, though famous forever afterward, may have produced for a matter of only a few months at the time. Such localities were Poonah, India, and Bergen Hill, N. J., both railroad cut and tunnel operations of short duration, whose claim to fame rested entirely on the great quantity and excellence of the specimens brought forth in a short period of time. In Switzerland, when the St. Gothard tunnel was built, the magnificent Quartzes and Cyanite-Staurolites made this a famous locality thanks again to a very short but prolific period of time.

It is also probable that many "temporary localities", such as railroad cuts and canal ditches, have produced, or may now be producing, just as fine specimens as Poonah or Bergen Hill, but have passed unnoticed due to lack of interest or knowledge of mineral specimen values by those engaged in the building work. Many of our finest specimens from famous localities are preserved thanks only to local interest at the time. We see a specific series of specimens from, say, "Joplin, Mo.," and do not easily realize that these are the pick of possibly 40 years of mining in a mining area of some 400 square miles.

The writer has not personally been on field collecting trips farther than the Eastern United States and Canada, and therefore is not well qualified to speak intimately of conditions elsewhere other than from repeated information. His own natural curiosity has led him to visit as many famous localities as were practically possible. I will try to correct some possibly false impressions regarding various phases of this subject in the following paragraphs.

Paterson, N. J., today is pretty much the Bergen Hill, N. J., of yesterday. The locality is a basalt (trap) quarry and has been a continuous producer of fine Zeolites and associated minerals for many years. In some ways it even exceeds Bergen Hill.

Nova Scotia is, as a name, not a proper locality label for a specimen, it being a Province some 300 miles long

and 100 miles wide, with the Zeolites for which it is famous being found only in a narrow strip of coast exposure of diabase rock about 90 miles in length along the Bay of Fundy. This locality was described in part by the writer in an earlier edition of ROCKS AND MINERALS*. The Zeolite district of Nova Scotia is today as good a collecting ground as ever, but here again one must remember that museum collections represent the accumulated material of many trips over a long period of time, and not merely the result of one excursion.

Joplin, Mo., is the somewhat misleading locality name given to specimens from a large mining field of which the city of Joplin is the largest town. The district is in parts of three contiguous states, and it would have been better had specimens bore the name of the specific mine or village that it came from instead of the useless "Joplin" which is of small value to a present-day collector. Two excursions to this district this past summer (1930) made by local enthusiasts proved it to be as great as ever for specimens of the Sphalerites, Calcites, Marcasites, Galenas, etc., for which it is justly famous.

Renfrew, Ontario, is a still more misleading name for a locality, as it is really meaningless for a field collector. There are specimens from this "locality" labeled variously Eganville, Renfrew, Renfrew Co., Sebastopol, Lake Clear and Turner's Island. The correct labeling is Turner's Island in Lake Clear, Sebastopol Township, Renfrew County, Ontario. Eganville is the nearest town, being about 20 miles distant. As Renfrew County is some 5,000 square miles in area, and as Renfrew city is the county seat of Renfrew County, and further as Renfrew city is some 50 miles from Turner's Island, a visit to "Renfrew, Ontario" would not yield many specimens. The actual locality is an island about a mile long and a half-mile wide, on which there are many open trenches averaging 60 feet in length, 15 feet in width and 15 feet in depth. They follow highly-mineralized white crystalline limestone "streamers" in the Laurentian gneisses, in which the fine specimens of Apatite, Pyroxene, Titanite and Wernerite were found and are still to be found. As the locality has not been worked for some 20 years, the limestone is badly weathered and the plentious Apatites frequently break up with the matrix Calcite. Specimens of the more resistant Pyroxenes, Titanites and Wernerites can be found today in as good condition as were the 'by-gone days' specimens. The writer's party only had about two hours time to spend at this locality, but firmly believes that a couple days of real intense collecting with the aid of a light maul and a few large chisels would yield a goodly crop of specimens comparing favorably with the past.

Hull, Quebec, is still another deceptive location. Hull is a city and is in Hull Township, an area of about 200 square miles. This township, as well as its adjoining Templeton Township, is studded with old Apatite and Phlogopite mines and trenches in formations similar to that at Turner's Island. It would be of interest to hear the mineralogical nomenclature for these mines as given the writer by one of the natives. It was given as having plenty of "Michael, Phosget and Proxination", as near as the writer could get it phonetically. The reference was, of course, to Mica, Phosphate and Pyroxene, the "Phosphate" being the local term for Apatite which is, chemically, Calcium Phosphate. The specimens of Pyroxene, Apatite and Phlogopite obtainable today in this district are as good as ever, excepting that there is not the extensive operating now as formerly and consequently more localities must be visited to make a good showing. Here again the exact locality is quite essential to a collector, as the country is rather rough and hilly with poor roads and the localities are small and in out of the way places.

Bisbee, Arizona, is still a producing copper mine, although the fine Azurites and Malachites of other days are passed with the increase in the depth of the workings beyond the oxidization zone. However, these specimens have been more than replaced today in the newer Tsumeb and Katanga districts of Africa.

The past greatness of California and Maine for Tourmalines and Beryls has been amply replaced by the present Minas Geraes District of Brazil, an area some hundreds of square miles in extent, in which the mineral crystals are found loose in the decomposed granites of the region. As plentiful as crystals from this region seem to be, the district is very in-

*The Zeolite Localities of Nova Scotia. By Morrell G. Biernbaum. ROCKS AND MINERALS Vol 2, No. 4, Dec. 1927.

accessible, being many hundreds of miles from Rio Janiero by rail and mule-back.

The greatness of Nizhni Tagilsk in the Ural Mountains of Russia may not be past if these mines are ever re-worked. At the present time, the Emeralds and Platinum greatness of this district has passed fairly favorably to Colombia, South America.

Franklin, N. J., is today producing some of its finest material ever. Many minerals found here today and in the past are unknown elsewhere in the world. It is a zinc mine owned and operated by the New Jersey Zinc Company. Miners collect and sell or exchange specimens, although some material may be obtained at the mill with the permission of the Company.

I hope that I have helped some collectors to realize that, from a world-wide standpoint, the opportunities of collecting fine mineral specimens today are as good as ever, with today possibly showing an even greater field than at any one similar time in the past. We may not have as many localities in a certain small district today as we did yesterday, because the scene shifts as years go on, but tomorrow may even see the greatness of a given area far superseding the yesterday.

In conclusion, of this rather roaming series of notes, may the writer say that he would be pleased to furnish what detail information he can to any reader contemplating visiting any of the famous localities he has been to.

On March 12 we had the happy occasion of receiving 25 new subscriptions from Edmund H. Cienkowski, Instructor in the Northeast High School at Philadelphia, Pa. All of these subscription, with the exception of one, were from Members of the Mineralogy Club of the High School and this Club, of some 30-odd Members has a membership of 100% in the Rocks and Minerals Association. We are grateful for the interest manifested in ROCKS AND MINERALS and the Rocks and Minerals Association by these young collectors.

Mining Laws of Canada—To meet the demands for information about the mining laws of Canada, the Mines Branch of the Department of Mines, has just published a report summarizing existing legislation on this subject. The report is a revision of an earlier publication entitled, "Digest of the Mining Laws of Canada", which was compiled and published in 1924.

Copies of the present report, No. 713, may be obtained on application to the Director, Mines Branch, Department of Mines, Ottawa, Canada.

Another Club recently formed in which a member of the Rocks and Minerals Association, A. Boswell, was mainly instrumental, is The Nevada Mineral Association of Reno, Nevada. The following item is taken from the March 13th issue of **Nevada Mining Press**, Reno, Nev.

"The Nevada Mineral Association has been formed in Reno by students of mineralogy and mining with the purpose of bringing together the prospector and collector of minerals and those who are interested in the study of these subjects. A mineral exchange will be established and a bureau of information. Meetings will be held weekly for the exchange of views and general information and the study of mineralogy and geology and their application to prospecting. Frank Loveridge, of Sparks, has been chosen president, C. E. Boswell, vice-president, Lawrence Loveridge, recording secretary and A. Boswell, corresponding secretary. Memberships are not limited to Nevada but studies will be centerd on minerals from this state and adjacent territory. Applications for membership are invited to address the corresponding secretary, Route 2, box 59, Reno."

Some Notes on Gems, More Particularly Those of Madagascar

—— *By* ——

W. E. HOWARTH

Department of Geology, National Museum of Wales, Cardiff, Great Britain

Department of Geology, National Museum of Wales, Cardiff, Great Britain

In Mr. Hart's interesting article on the distribution of gem Tourmaline, which appeared in the March 1931 number of ROCKS AND MINERALS, his map indicates Cornwall as one of the sources of supply (p. 33). While tourmaline is very common there as the black variety (schorl), specimens suitable for cutting are exceedingly rare, and I personally have never seen one.

Certainly British jeweller's supplies do not come from there, but in the main from Brazil and Ceylon.

Mr. Hart, too, is not quite accurate in saying that Madagascar has not been developed for the supply of gem tourmaline, as a couple of years ago the Compagnie Generale de Madagascar was supplying collections of Madagascar gems, cut in Paris. I induced the Company to supply me with a better series than the one they were marketing. Perhaps an account of what I obtained may be of interest to the readers of ROCKS AND MINERALS.

In addition to eight or ten differently colored tourmalines, a dozen beryls (including very fine aquamarines and morganite), garnets, amethysts, topaz, and yellow, milky and rose quartz, I was able to obtain:—

Ferriferous Orthoclase (a very fine gem unique to Madagascar).

Oligoclase (a specimen obtained by mistake as a colorless spodumene, and I think unique).

Diopside.

'Spessartite' a particularly beautiful topaz-like garnet, which however does not give cut stones of more than half a carat in weight. I put the name in inverted commas because I find the refraction index is not that of true spessartite, but the stone is a garnet and this name is as good as any.

Scapolite (or Wernerite).

Cordierite (Water Sapphire).

Spodumene the yellow variety and also the lilac variety called **Kunzite** which was unique to California before its discovery in Madagascar.

Amazonite.

Ceylonite (Pleonaste or Black Spinel).

In addition to these, Lacroix in his great monograph on the mineralogy, petrology and economic resources of Madagascar also records **Danburite, Kornerupine, and Ruby,** but these are very rare in quality suitable for cutting, and I have not been able to obtain specimens.

The Compagnie Generale de Madagascar does not, I believe, retail cut stones except in series for propaganda purposes, but no doubt they would be willing to give information as to where they can be obtained. No collection of gemstones can be regarded as complete without Ferriferous Orthoclase, Diopside, Spessartite, Wernerite, and Spodumene from Madagascar.

The Girl Scouts of Philadelphia, Pa., have recently organized a Rocks and Minerals Club which is growing very favorably. The Club meets once a month at the home of the President, Mrs. W. Hersey Thomas and their plan of action is to study one metal each month for the first six months—the members bringing such specimens as they can, thus combining study and collecting.

A number of the members are also members of the Rocks and Minerals Association and we feel assured that before long the Club will also have a 100% membership in the Rocks and Minerals Association as is the case with the Mineralogy Club of the Northeast High School in their city.

Field Museum Notes and News Items

Contributed by

THE FIELD MUSEUM OF NATURAL HISTORY

Chicago, Ill.

A truly primeval forest, with its strange and diverse flora which flourished in Devonian time, according to scientific estimates some 350,000,000 years ago, is the subject of a new large mural painting which has been installed on the walls of Ernest R. Graham Hall at the Museum.

The painting is the latest addition to the series of twenty-eight pictures recreating the world from the beginning of time to the dawn of history, which are being presented to the Museum by Ernest R. Graham. Charles R. Knight, of New York, is the artist. To date twenty-three of the paintings have been completed and placed on exhibition.

It was during the period represented in this painting that the gradually expanding plant life on earth first attained the size of trees, according to Sharat K. Roy, Assistant Curator of Invertebrate Paleontology at the Museum. Most of the types of plants and trees shown in the picture are restorations resulting from study of actual fossil specimens, some of which have been collected in parts of New York State in the vicinity of the Catskill Mountains.

A prominent place in the picture is taken by the oldest of all recorded trees, the Gilboa tree or Eospermatopteris (dawn of seed ferns). These were majestic trees attaining heights of thirty to forty feet, and in appearance resembled somewhat the tree ferns of modern tropical jungles.

Also shown in the painting are giant ancestors of the modern club mosses; calamites, which were the predecessors of today's "horsetails" or scouring rushes; and a variety of smaller plant species.

A collection of twenty-nine opals of various kinds, seven star sapphires, and various other gems, all presented to the Muesum by Mrs. Joseph W. Work, of Evanston, Illinois, is now on exhibition at the Museum.

A mammoth crystal of beryl, weighing approximately 1,000 pounds, has been presented to the Museum by William J. Chalmers, Member of the Institution's Board of Trustees, it was recently announced by Stephen C. Sims, Director of the Museum. The crystal has the form of a somewhat flattened tapering hexagonal prism. It is three feet two inches long, and has a diameter of two feet at the base, the widest part. It was discovered in a quarry at Albany, Maine.

The huge specimen has been added to the Chalmers crystal collection on exhibition in the Department of Geology, one of the finest collections of its kind in the world, which has for years been supported by Mr. Chalmers. It will be the largest specimen in the exhibit, and is a striking illustration of the size to which crystals grow.

Beryl is a comparatively rare mineral, chiefly known in its gem form of emerald and aquamarine, according to Dr. Oliver C. Farrington, Curator of Geology. It deepens somewhat in color with increasing humidity in the atmosphere, and by observing these changes quarry workmen say they can foretell weather changes.

As the chief source of metallic beryllium, one of the lightest of metals, beryl is becoming of economic importance. Beryllium is useful in airplane construction and other work where extreme lightness combined with strength is an important factor.

Many metals known to few people, with collections of objects illustrating their uses, are on exhibition in the Department of Geology at the Museum.

Rough diamonds from nearly all the important fields of the world, as well as several finely cut large specimens, are on exhibition in the collection of gems and jewels at the Museum.

Important specimens of crystals, and gem materials of various kinds, collected in different parts of America, and in Africa, South America, Afghanistan and Madagascar, have recently been presented to the Museum by William J. Chalmers, of Chicago.

A cut brown-pink gem tourmaline weighing fifty-eight carats was recently presented to the Museum by R. T. Crane, Jr. This large and flawless gem has been placed on exhibition in the Museum's gem collection.

A collection of "volcanic bombs", obtained by the Marshall Field Expedition to Mount Taylor, New Mexico, has been placed on exhibition at the Museum. They were colected by Henry W. Nichols, Associate Curator of Geology, and leader of the expedition.

Volcanic bombs are so-called because of the form they take, which resembles a common type of man-made bomb. They do not explode, although they fall from such height that they can do much damage when they hit the earth, according to Mr. Nichols.

"Volcanic bombs have a curious origin," states Mr. Nichols. "A volcano in violent eruption throws melted lava high in the air. Most of it is torn to fragments by the violence of the eruption and falls as volcanic ash and scoria. Occasionally a lump of lava in a semi-fluid state is thrown so high that it has time to cool enough, before falling to the earth, to retain the form impressed upon it during its aerial travel. Such a mass during its ascent and descent spins rapidly. The rapid revolution forces the plastic mass to assume the spindle form of the volcanic bomb. The outside chills rapidly so that the bomb has a thin glassy glaze. The inside, cooling more slowly, may have the aspect of ordinary stony lava. Usually, however, the molten lava is saturated with dissolved gases and steam, in which case the inside of the bomb is porous and resembles pumice or the inside of a loaf of bread."

The Mount Taylor volcano where the Museum's collection was obtained was active about twenty million years ago, according to scientific estimates.

The Museum has received a gift of thirty-seven specimens of fossil invertebrates found near the headwaters of the Amazon, from M. L. Velasco, of Iquitos, Peru.

An exhibit of the fibrous minerals from which asbestos is made, with specimens of a wide variety of asbestos products, is available for study among the economic geology collections at the Museum.

A reproduction of a Utah gypsum cave, made from huge transparent gypsum crystals obtained from such a cave, is on exhibition at the Museum.

Henry W. Nichols, Associate Curator of Geology at the Museum, who during his many years on the Museum's Scientific Staff has traveled with expeditions to far parts of the world in search of specimens, has recently found an attractive subject for study right in the materials of which the museum building is constructed.

The floor of Stanley Field Hall, which is the central hall of the Museum, and the treads of the stairway in the building are tiled with marble from Carthage, Missouri, and this marble was formed in a sea of Mississippi Age more than 3,000,000,000 years ago, Mr. Nichols says. Numerous fossils of the animals that lived in that sea are now found on the face of the tiles. Most of them are shells, somewhat obscurely displayed as they have nearly the same color as the marble, but they are very distinct when once seen.

There is also, Mr. Nichols states, a less numerous group of fossils which are more plainly seen because their white color contrasts with the darker marble. These are thin rod-like creatures with thin wide flanges wound spirally around them after the manner of screw threads. They are the colonies of minute animals (Bryozoa) which, for some unknown reason, always grew in this spiral form. These fossils have been named Archimedes after the Greek philosopher who first used such a screw form for raising water.

Prehistoric creatures which look like mythical monsters are shown in a large mural painting placed on exhibition in the Museum. They are reptiles of the Permian Period, which lived, according to scientists' estimates, about 215,000,000 years ago. The painting constitutes the latest addition to the series of twenty-eight restorations of prehistoric life which are being installed on the walls of Ernest R. Graham Hall in the Museum. Charles R. Knight is the artist.

The animals shown in the new painting include curious fin-back reptiles of two kinds, and several lizard-like reptiles. The "finbacks" were animals remarkable not so much for their size as for their unusual proportions and grotesqueness, states Prof. Elmer S. Riggs, Associate Curator of Paleontology. One of the kinds represented, the Dimetrodon, was armed with an ugly series of sharp-pointed teeth which proclaim him an animal of vicious habits and a flesh-eater. On his back, spines arose to a height equal to the length of his body, and these were covered with a membranous covering which extended along the back and formed a great fin-like projection.

Naosaurus, the other fin-back, was quite similar in appearance, but was an inoffensive plant-eater. The lizard-like reptiles, also shown in the painting, while not unlike certain modern lizads, belonging to an old order which has long been extinct.

"Basking along the shores of quiet lagoons, these animals formed a distinctively reptilian community," says Prof. Riggs. "No inquisitive mammals aroused them from their drowsy sleep under tropical suns; no birds perched upon the giant horsetail rushes which bordered the shores. Great dragon flies may have skimmed over the waters or rested on a snag of a broken tree, but no hum of busy insects filled the air. It was a time of heavy atmosphere and sluggish life, which waited through the long ages until awakening intelligence should dawn upon the animal world to give more activity to the scene."

How valleys are formed by erosion is illustrated by a model in relief which is on view in the Department of Geology at the Museum.

A bowl one foot in diameter, cut from a single piece of exceptionally fine rose quartz, and noteworthy for its rich color and size, is on exhibition in H. N. Higinbotham Hall at the Museum. It is a gift from R. T. Crane, Jr.

A large stump of a fossil tree which grew in the Carboniferous Age in a forest which has changed after millions of years into a bed of coal near Ziegler, Illinois, is on exhibition at the Museum.

The direct relation of fossils, which are regarded by the average person as curiosities with little, if any practical use, to the cost of gasoline and the success or failure of mining ventures, is discussed by Sharat K. Roy, Assistant Curator of Invertebrate Paleontology at the Museum, in an article in the December issue of **Field Museum News**, the monthly bulletin published for the 6,000 members of the Museum.

"Fossils which are large and can easily be observed by the naked eye are called macro-fossils," writes Mr. Roy. "Those so small they can be seen only with a microscope are micro-fossils. The value of a fossil, however, has nothing to do with its size. A fossil one-tenth of a millimeter, tinier than a particle of dust, may have greater economic and correlative significance than one ten feet or more long.

Of late, especially in oil geology, vast sums of money are being saved by the use of micro-fossils as guides in subsurface correlation. These serve as guides or horizon markers because they are limited in their vertical range. The study of guide-fossils has a far-reaching significance. It not only enables a paleontologist to state the age and character of reservoir beds and source rocks of petroleum supply, but also offers him ample data for predicting accurately what character of material he may expect to penetrate at a given depth.

The Second Rawson-MacMillan Subarctic Expedition of Field Museum in Baffinland yielded a great number of micro-fossils, which, when identified, will help solve some of the problems of the stratigraphy of the Arctic regions. Lack of knowledge on this subject has hindered working out fully the geologic succession in the United States."

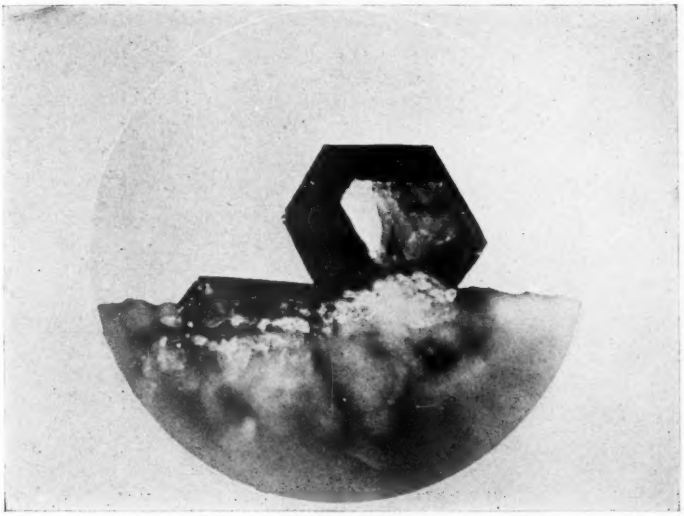


PLATE No. 1 (x19)
PYRRHOTITE
Broadway and 218th Street, Manhattan Island, New York City

PLATE No. 2 (x1½)
PYRITE IN LIMESTONE
Broadway and 207th Street, Manhattan Island, New York City

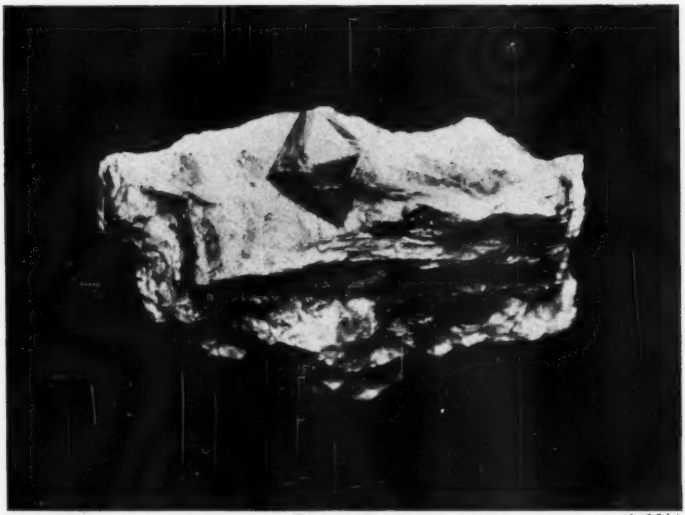


PLATE No. 3 (x1½)
QUARTZ (BI-PYRAMIDAL)
Broadway and 164th Street, Manhattan Island, New York City

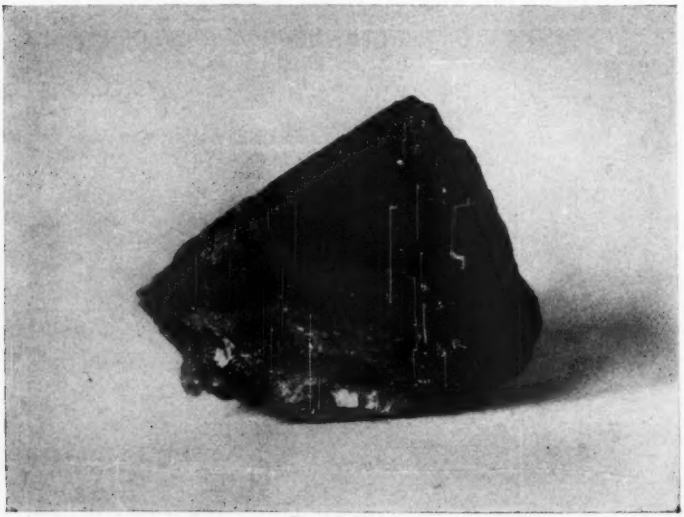
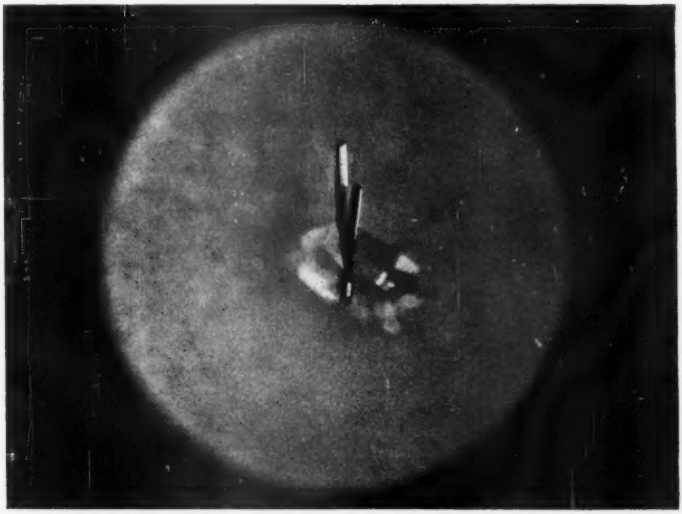


PLATE No. 4 (Actual Size)
MAGNETITE
(Showing Parting Planes)
Broadway and 176th Street, Manhattan Island, New York City



G. E. ASHBY, Photomierograph PLATE No. 5 (x15)

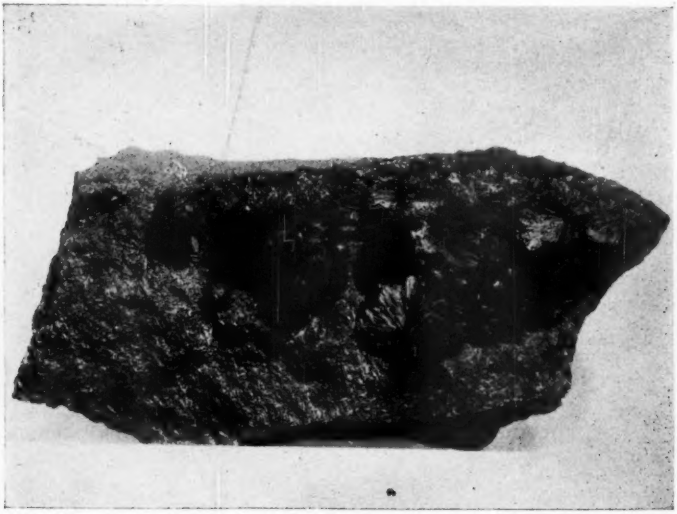
RUTILE ON QUARTZ

Broadway and 218th Street, Manhattan Island, New York City.

PLATE No. 6 (Actual Size)

CALCITE COATED WITH ASBESTOS

Grand Concourse and 170th Street, Bronx, New York City



AM. MUS. NAT. HIST. COL. PLATE No. 7 (x¾)

SPHAEROSIDERITE AND STILBITE

Second Avenue and Forty-fifth Street, Manhattan Island, New York City

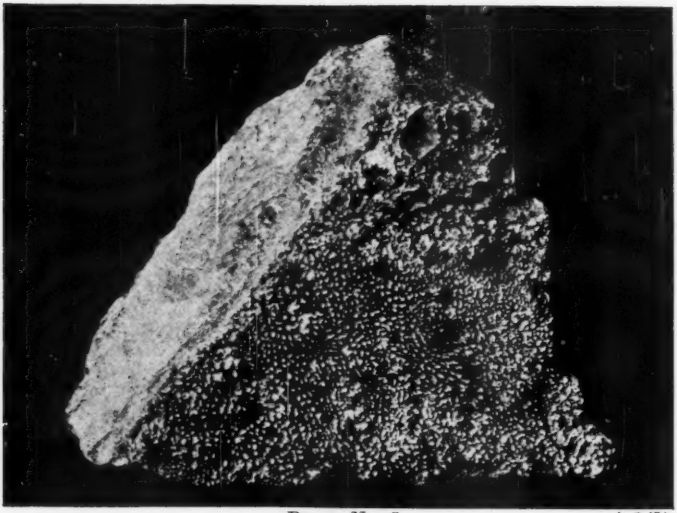


PLATE No. 8 (x2/3)

ARAGONITE, VAR. FLOS FERRI

Broadway and 215th Street, Manhattan Island, New York City

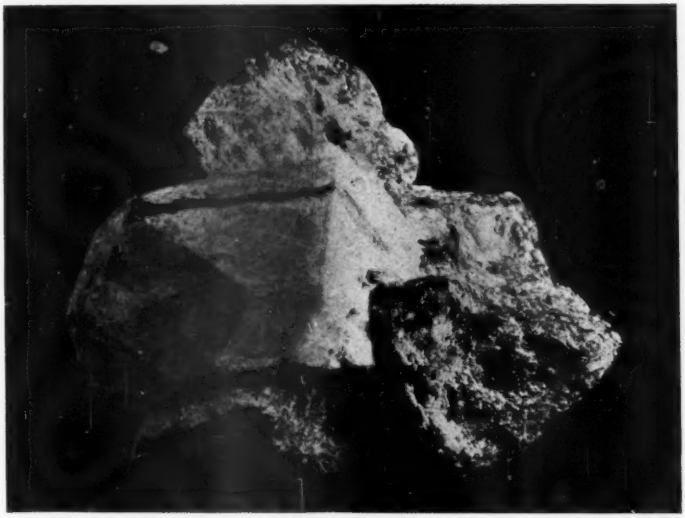
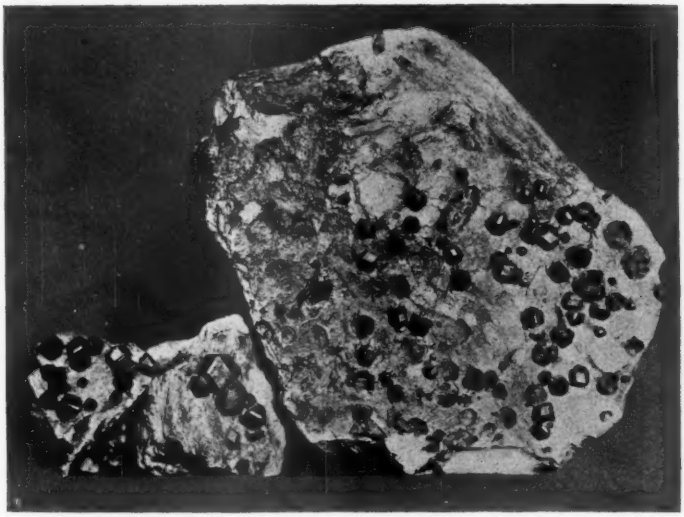


PLATE No. 9 (x2/3)
OLIGOCLASE
Broadway and 161st Street, Manhattan Island, New York City

PLATE No. 10 (x¾)
PYROXENE, VAR. MALACOLITE (WHITE)
Broadway and 207th Street, Manhattan Island, New York City

PLATE No. 11 (Actual Size)
PYROXENE, VAR. MALACOLITE (GREEN)
Jerome Park Reservoir, Bronx, New York City

PLATE No. 12 (x½
BERYL
Broadway and 157th Street, Manhattan Island, New York City



G. S. STANTON, COL. PLATE No. 13 (x1/3)
GARNET, VAR. ALMANDITE
Broadway and 65th Street, Manhattan Island, New York City

PLATE No. 14 (Actual Size)
BLACK TOURMALINE
Broadway and 162nd Street, Manhattan Island, New York City

W. G. LEVINSON, Photo PLATE No. 15 (1901)

EXCAVATION IN MANHATTAN SCHIST

Riverside Drive, 92nd to 93rd St., Manhattan Island, New York City

PLATE No. 16 (1913)

EXCAVATION IN INWOOD LIMESTONE

Broadway and 207th St., Manhattan Island, New York City

The Great Southwest and Its Minerals

—— *By* ——
EDMUND H. CIENKOWSKI

At the December meeting of the Philadelphia Mineralogical Society, held on December 4th, 1930, at the Academy of Natural Sciences, the writer, a member of the society and an instructor in the Northeast High School spoke of his trip to the mining regions of the Southwest last summer in search of mineral specimens. The trip was taken in his private automobile and he was accompanied by two of his mineralogical students, Mr. Fred Reinitz and Mr. Edward K. Graham, both members of the Rocks and Minerals Association.

The first stop was made at the famous fluorite localities near Rosiclare in southern Illinois. Many interesting specimens of green, purple and yellow fluorite were obtained. The Daisy, Hillside and Fairview mines were especially productive and their managers were most cordial in extending the courtesy of the mines to the party.

From here the party moved on to the lead and zinc mines of the Tristate district of Missouri, Kansas and Oklahoma. Specimens of calcite, sphalerite, galenite, marcasite, chalcopyrite, dolomite, etc., were obtained in excellent crystallizations. One pocket of galenite yielded more than one hundred crystals with brilliant metallic lustre. The specimens were carefully wrapped in soft paper and were shipped to Philadelphia by express. Boodle Lane, a mineral dealer of Galena, Kansas, accompanied the party into several of the mines.

Hot Springs and its quartz localities, Caddo Gap and Crystal Mountain, were the next objective. These were reached by turning south from Joplin through the Ozark Mountains. The scenery on this part of the trip was most appealing, especially after the rather dull and hot and uninteresting ride across the plains of Ohio, Indiana, Illinois and Missouri. The localities near Caddo Gap yielded the best crystals in the district and many specimens of clear, pellucid quartz were collected. Quite a few of these showed the right trigonal pyramid modifications, s (11$\bar{2}$1) and also the left. These right and left-handed quartzes were especially desired on account of their rarity.

A hot ride across western Arkansas, Texas and New Mexico brought the party to Carlsbad Cavern. Through the courtesy of the Department of the Interior a permit was granted Mr. Cienkowski to collect specimens of stalactites and stalagmites for the school collection. The cave is located in the foothills of the Guadalupe Mountains and is renowned for its immense size. Our eastern caves pale into insignificance when compared with it. One room in it has a length of 4000 feet, and is 600 feet wide and the ceiling looms 300 feet above. The largest stalagmite in the cave has a height of 60 feet and its age is estimated at 60,000,000 years. At night, thousands of bats, which have made the cave their home by day, fly south to feed on insects and other prey.

The localities in the Organ Mountains were next visited and some wulfenites were obtained. Many of the mines in this copper center were closed down and this, of course, militated against extensive collecting.

A rapid run took the mineral collectors to Bisbee, second greatest copper region of the United States. The interesting collection of minerals in the Bank of Bisbee were examined and although Bisbee is no longer yielding the beautiful cyrstallizations that made it famous for its azurite and malachite and cuprite yet the party was fortunate in getting some fine specimens of these minerals mainly by purchase from old collections made at the mines years ago.

Tombstone, Arizona, was next visited and the colorful career of this old mining town of former days, was revived in such structures as the Bird Cage Theatre and the Schieffelin Monument. The Silver King and the Vulture no longer exist but their memories will endure forever. No longer do its inhabitants fight it out with six-guns and its streets now re-echo to a new kind of noise, that of the tourist and the sight-seer.

Near Tucson, the Old Yuma mine was visited and excellent specimens of van-

adinite were obtained from the various levels. The mine is not working but permission was obtained to enter the mine by way of the shaft. Water was carried for several hours as the mine is located out in the desert and is hot and dry. The best specimens came from the 150 ft. level.

After leaving Tucson the party toured north and visited Ray, Superior and Globe. Near Globe, at the Apache mine, additional vanadinites were collected. The country hereabouts is most scenic and many varieties of cacti were observed. One of these, the Giant Cactus or Sahuaro, sometimes reaches a height of 50 feet or more.

The party next followed the famous and historic Apache Trail to the Roosevelt Dam, inspected the Tonto Cliff dwellings and after a hundred miles of mountain driving through some of the most beautiful parts of Arizona, arrived at Phoenix.

From Phoenix the route was followed to Gila Bend and Yuma. Across the lower part of California no mineral localities were encountered and our party finally arrived at San Diego. From San Diego a short ride of some thirty miles brought them to Escondido, home of Albert Everitt, mineral dealer and collector. Pala and Mesa Grande are nearby and many fine specimens of tourmalines and kunzites were obtained from these world famous mines of San Diego county. This region in California lies almost wholly in San Diego county and some thirty years ago began to yield the crystals which have given the region its fame as a gem producing locality.

From here the party moved on to Los Angeles, visited Long Beach, Hollywood, Beverly Hills and Santa Monica. After a ride over the famous "ridge route" of California the Sequoia National Park in the Sierra Nevada Mountains was visited. The giant trees are standing in groves at high altitudes and one must drive over many bends and curves before reaching the elevation at which these "oldest of all living things" push their leaves into the sky. One evening was spent in camping under the shade of the General Sherman tree, the largest tree in the world with a diameter of 38 feet. It was getting late in the summer now and plans were made for the return journey. The path to Bakersfield was retraced and after entering the Mojave Desert the party proceeded on to Barstow and Needles. The Oatman gold district was next visited and after some rough riding over the not too smooth roads of northern Arizona the little town of Williams was reached, gateway to the Grand Canyon, a distance of some 50 miles. After visiting the Grand Canyon the party moved on to Flagstaff, visited the Lowell Observatory, renowned for its discovery of the new planet, Pluto, and arrived finally at the Petrified Forest near Holbrook. There are several forest areas and the writer was given permission to take away a number of specimens of petrified wood for the museum of the high school. One of these specimens, nearly 80 pounds in weight, has been polished and was exhibited by the writer on the night of this talk. The Painted Desert was visited and some of the interesting sands of this region were obtained for packing into bottles. It is claimed that over 60 different hues can be recognized.

The party next toured into New Mexico, stopped at Kelly, New Mexico, and procured some of those interesting blue smithsonites which rival those of Laurium, Greece. From Socorro, the trail led through Albuquerque, Santa Fe and Taos. Near Taos the interesting and highly productive deposit of lepidolite was examined and beautiful specimens associated with albite and columbite were collected. At Embudo, via Pilar, a short distance from Taos perfect right angle twins of staurolites associated with garnets were collected in the arroyos. From Taos the party moved on to Raton Pass, up to Trinidad, Pueblo, Colorado Springs, ascended Pike's Peak on the cog railroad, went up to Denver and visited the Pohndorf's, well-known mineral dealers and jewelers of that town. At Colorado Springs a short visit was made to Lazard Cahn who extended to his visitors a most hearty welcome. His personal collection, rich in many beautiful specimens was thrown open to inspection and a number of hours were spent in viewing his suites of certain minerals, especially the Pyrites of Leadville and the Vanadinites from Tucson, Arizona.

From Denver the party followed the Lincoln Highway home and arrived there a most contented group, filled with rich mineralogical experiences and laden with specimens. The Southwest had given abundantly. The trip took two months and the total distance covered was in excess of 9000 miles.

The Gem Department

Conducted by GILBERT HART

Each issue Mr. Hart will give in this department information concerning gems and gem minerals. As Mr. Hart invites correspondence relating to the department, letters should be addressed to him as follows: Gilbert Hart, St. Edwards University, Austin, Texas.

PROSPECTING FOR GEMS

The summer season of holidays and vacations makes us all think of searching the big outdoors for our favorite minerals. Gems are favorites with most of us, but we seldom find them and more rarely hunt for them. The biggest item in valuing gems is often their rarity, and if they are uncommon most people are sure they never can find them. But some gems are fairly common as minerals, tho clear large crystals suited for facetting are hard to find; and others are so usual that gem values lie only in the cost of cutting. When one goes "prospecting for gems" in his two-weeks vacation, he will look for this type of gems; perhaps finding interesting crystals, and having them cut by the local lapidary as souvenirs of the trip; or perhaps finding nothing but a fine coat of tan, plenty of healthy exercise in the fresh air, and memories of a happy time in woods and field.

One can go on his prospecting trip anywhere, and probably have no tangible result; he can carefully plan an examination of a known locality with equal profit; but perhaps the best way is to visit some area where no one thinks of gems but where the general geological features have been studied. The prospector will surely know the crystallography of the various gems, typical forms and habits of crystals, hardness, specific gravity, etc., to enable him to identify any possible finds. In special preparation for his outing a study of the geology will be advisable.

One or another of the gem minerals is found in almost every type of formation. The sedimentary rocks, when flat and unchanged in position by mountain-building forces, are among the poorest terrains for the gem prospector. But in this type of country one often finds the cryptocrystalline silicas, flint, jasper and chalcedony, and such soft ornamentals as alabaster and gysum. These often have but little natural beauty, and are opaque; but cutting and polishing brings out hidden details of coloring and gives the finder an unusual stone which merits the semi-precious class only by reason of this color. Geodes from these regions may furnish drusy interiors of pure rock-crystal; and especially fine fossils such as brachipods or trilobites may be found for mounting in stick-pins or brooches.

In many places such flat-lying sediments are the country rock of fissure veins of fluorite, barite, lead and zinc ores. Fluorite from such veins often cuts into beautiful, but soft and easily broken stones; and other rarer minerals are similarly used.

The famous kimberlite pipes of diamond-bearing rock are found in the flat Karoo sandstones and shales in Africa, and traversing similar sands and clays in Arkansas. Serpentine derived from such rocks always furnishes an interesting prospecting ground.

Closer to the mountainous regions we find that the strata are folded, bent and broken. Few new minerals are found in these disturbed formations; but veins are far more common, and carry greater variety of ores. There are, however, very few gemmy crystals excepting the omnipresent quartzes and very occasional gems like hematite and barite, rarely used and of little value when cut.

The core of all our mountain systems is huge masses of granitic rock, solidified from a molten lava somewhere be-

low the earth's surface. These rocks are aggregates of small crystals of various types which formed as the temperature of the molten body cooled. The residual liquor, left after most of the mineral matter had crystallized, contained usually a concentration of the rarer elements. When this mother-liquor cooled and crystallized, it formed veins and dikes of varied type, which are the ledges of the majority of gem minerals. The pegmatites are such bodies, concentrations from enormous masses of once-molten granite, which contain the only minerals with large proportions of many rare elements such as lithium, beryllium, and tantalum. Such rare metals in silicate compounds yield the rare minerals whose most important use is gems. So from the pegmatitic dikes of granites and other igneous rocks we find tourmaline, topaz, beryl in all its varieties, chrysoberyl, many quartz gems, corundums, spinels and the commoner feldspars. Sometimes these veins are within the igneous rock masses, often they cut across the junction between granite and surrounding sediments.

We all know how the lava of the granite sometimes rises to the open air, and flows from volcanoes. A vast number of minerals are associated with volcanic action, particularly with the "fumeroles" or steaming vents found near many eruptive centers. Most of these are soft and easily shattered species and are not used as gems. But in some places the sherry-colored topaz is found in cavities in the lava, probably beneath the spout of an ancient fumerole. As the steaming vents of the volcanoes get cooler chalcedony and opal are deposited; the silica-laden water may break out through other openings depositing its load in the holes of the rock as clear dendritic chalcedony or as agate in bands of varying texture and color. Associated with basic lavas are often waters highly charged with zeolitic minerals. Few of these are gemmy, but prehnite and apophyllite have attractive coloring and look well when polished.

When sediments or granitic rocks were buried under later sediments in the beds of prehistoric oceans, the pressure of their burden and the high temperatures of great depths caused changes in the mineral-make-up of the rocks. Of the many metamorphic minerals thus formed some are used by the jeweler, such as staurolite, iolite, and garnet. The metamorphic rocks compose the third great class of geologic division, and originate from either or both the others.

With this short sketch of the geology of gems, the prospector can learn the possible occurrences in the area he is to visit. The federal geological survey and the various state surveys will furnish geological reports of most parts of our country at nominal sums. Such reports will rarely mention gems because gems form such a small part of the resources or of scientific interest; but they are accurate in mapping and in geology, so that one can learn from them the types of minerals he might meet.

Tools for the trip would include the usual mineral collectors outfit of hammer, chisels, hardness gauge, and perhaps a field blow-pipe. If extensive work is anticipated one should be prepared with picks and shovels, and even blasting equipment. A small pan is useful for concentrating gravels; and a hand-lens enables one to identify fragments in the concentrates.

In a well-known country the collector often prefers to examine known prospect pits; but in other cases, he will find the gem-lode by tracing fragments found in stream-beds. Here the pan is useful to separate the lighter quartz and feldspar grains from heavier minerals such as tourmaline and beryl. The pan is in common use by gold prospectors, but is not often found in the East. A small pan, 9 inches in diameter at the top, 5 at the bottom, and 2 inches deep, made of light gauge sheet iron, is light enough to be carried easily and serves to concentrate small lots, where one wishes merely to identify the heavy minerals, much better than the heavier miner's pan, used for washing out gold in larger quantities.

The pan is manipulated by a swirling motion, which tosses the lighter sand out from the heavier fragments. The motion is quickly acquired, but almost impossible to explain.

The prospector starts in a likely looking stream-bed, perhaps located from a geological map near the contact zone of granite and country rock. Along the stream will be found beds of sand of varying fineness. The coarser gravels can be examined without trouble, but the sands must usually be panned to find fragments other than quartz. Good sized pieces of tourmaline or beryl indicate proximity to the pegmatite of their ori-

gin and the searcher carefully considers every branch of his stream as a possible feeder for these fragments. He watches the banks and valley for irregularities which might be caused by the weather-resisting pegmatite. When the parent body is found, the prospector begins his real work.

In the soil the resistant minerals will accumulate, always downhill from the ledge. Complete crystals of many gems can be found just below the humus or lower in the decomposed rock. The soil is thus searched by simple digging and breaking up of clods, and the ledge is uncovered. Perhaps picks and shovels are then used to dig the rock in search of further minerals. Most often the gem types are in isolated pockets within the solid rock. No definite arrangement of the pockets is known, and usually, unless the rock itself is saleable, it will not be worthwhile to prospect within the ledge for gems. The weathering processes have loosened many, and washed away the lighter constituents leaving some gem material in the soil or in the nearby stream. Usually these accumulations should satisfy the temporary prospector, who can then extend his search after "getting the cream" from his first discovery.

Gold has been found in every province of Canada except Pince Edward Island, but the chief source of production is the gold bearing quartz deposits of the Porcupine and Kirkland Lake districts of Ontario, which are responsible for more than 83 per cent. of the total output. British Columbia is second in gold production.

John A. Renshaw of 1038 Baldwin Ave., Arcadia, Calif., is trying to organize a mineralogical club in Southern California and desires all those interested to get in touch with him at their earliest. A number of prospective members are lined up but more are needed if the Club is to be a success.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST, 24, 1912.

Of Rocks and Minerals published Quarterly at Peekskill, N. Y., for April 1, 1931.

STATE OF NEW YORK, } .88.
COUNTY OF WESTCHESTER }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Peter Zodac, who, having been duly sworn according to law, deposes and say that he is the Editor and Publisher of the Rocks and Minerals and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Name of	*Post Office address—*
Publisher, Peter Zodac,	Peekskill, N. Y.
Editor, Peter Zodac,	Peekskill, N. Y.
Managing Ed., Peter Zodac,	Peekskill, N. Y.
Business Mgrs., Peter Zodac,	Peekskill, N. Y.

2. That the owners are: Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.) Peter Zodac, Peekskill, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

PETER ZODAC, Publisher.

Sworn to and subscribed before me this 21st day of April, 1931.

KATHRYN M. FLANAGAN.

(Seal.)
My commission expires March 1933.

Silver Producing Mines of British Columbia

—*By*—

V. L. EARDLEY-WILMOT*

Mines Branch, Department of Mines, Ottawa, Canada

Native silver rarely occurs in British Columbia. Almost all of the metal produced in the province is obtained from silver minerals associated with lead and zinc minerals or less frequently with copper or gold. Nearly every metalliferous mine contains some of the white metal but, with few exceptions, these mines are small and their commercial existence depends largely on their silver content.

British Columbia had in 1928 the record production of 10,600,000 ounces of silver, which is over three million ounces greater than that of Ontario, the next largest silver-producing province. The production estimated for 1929 is only slightly less, being 10,400,000 ounces. The actual market value of this output is, however, considerably lower than that of the previous year, owing to the lower price of 53.1 cents as compared to 58.2 cents per ounce in 1928.

The largest silver producers in British Columbia are mines in which the silver content is low and the metal of only secondary importance, their high output being due to the large tonnage treated. The well known Sullivan mine, of the Consolidated Mining and Smelting Company is situated in the East Kootenay district, north of Kimberly. The ore is an immense replacement deposit of very fine grained galena (lead), sphalerite (zinc), pyrrhotite and pyrites (iron sulphides). The capacity of the concentrator has recently been increased from 4,000 tons to 6,000 tons of ore per day. The silver content averages about 4 ounces per ton and an output of over 5 million ounces annually is now being maintained, making the Sullivan the largest individual producer of silver in the British Empire.

In the Slocan silver-lead-zinc area between Slocan and Kootenay lakes, the silver values are high. There are about half a dozen concentrators having capacities of 50 to 200 tons per day each. During 1928, forty shippers produced a total of over one million ounces, which is three times the output of 1927, and this activity continued throughout 1929. A new concentrator was erected to treat the Mammoth mine ores, which have a high silver content and this mine should be a substantial producer. Another producer is the Ruth Hope, which is looking better than in 1928; the Noble Five has high grade silver-lead veins at depths which were never considered a few years ago and their mill is working to capacity. The Hewitt and the Galena Farm have consolidated, and remodeled the latter mill, while the Cunningham interests are again active at the Black Colt, in which spectacular silver-lead ore has recently been exposed. The McAllister is probably the only property in the province which is mined for its silver content only. During 1928 it was the largest shipper of silver in the district with 210,000 ounces, but the known ore bodies are now almost depleted.

Wallace Mountain camp, at Beaverdell in the Greenwood district, though comparativly small, is one of the richest silver areas in the province. So much so that the crude ore, averaging in the case of the Bell mine—over 200 ounces per ton, is shipped direct to the Trail smelter without concentration. There are about 10 operators in the area and the output for 1928 was almost half a million ounces, a total which probably was exceeded in 1929.

There are a number of operating mines in the Nelson and more southern areas, none of which average more than 4 or 5 ounces of silver per ton, but their

total output amounts to about 50,000 ounces.

The new 300-ton concentrator of the Monarch mine at Field was in operation in December, 1929, treating a large reserve of lead-zinc ore averaging 1.5 ounces of silver from which a substantial output of these metals is expected.

The Britannia mine on the coast, north of Vancouver, is essentially a copper producer, having only about 0.15 ounces of silver per ton of mill feed, but, on account of the large tonnage treated, this mine is the sixth largest producer with a little over 200,000 ounces annually.

In the northern part of the province several mines have mill feeds ranging from 25 to 50 ounces of silver. Of these, the Duthie mine at Smithers on the Skeena river is the largest producer with over 325,000 ounces, being the third in the province.

Further north the Granby Company's Hidden Creek mine at Anyox is a large replacement body containing copper with some gold and about 0.20 ounces of silver per ton. Owing to the large tonnage treated the output amounts to over a quarter of a million ounces of silver making the Granby Company the fourth largest producer. The Bonanza mine, the Company's comparatively new property adjoining on the north, is a similar type of ore body carrying a little over one-half ounce of silver and at present accounts for about one-fifth of the silver output from the Anyox mines.

In the Portland Canal district, which borders on Alaska, the Premier mine is the one and only outstanding producer. The ore is a pyrite-gold-silver with a very little lead and zinc, the mill feed being about one-half ounce gold and 7 ounces of silver per ton, from which an annual output of 2½ million ounces of silver is being maintained. During the last 10 years the Premier has produced over one million ounces of gold and twenty-six million ounces of silver. Recent discoveries below the No. 5 level have prolonged the life of the mine. The British Columbia Silver Mines Ltd. adjoining on the north, are operating in the same ore body but are not likely to be shippers until satisfactory arrangements for handling ores have been made with the Premier Company. Scores of other mines and prospects in this district for many years have been operated but with little production. Small but spectacular finds in which the ore carries native silver, have been made, but none so far have turned out to be important producers.

In the far north the recent discoveries in the Telsequah River area, and a few miles from the Alaska boundary, may lead to future production. The ore zone averages 20 feet wide carrying high values in lead, zinc, and copper in which silver is associated with the lead.

With the exception of the Premier, the ores and concentrates from all the British Columbia shippers are treated in the Consolidated Mining and Smelting Company's plant at Trail in which about 8 million ounces of pure silver bullion are refined annually. The company recently reduced the penalty on the zinc content in silver-lead ores, as well as reducing the milling charges.

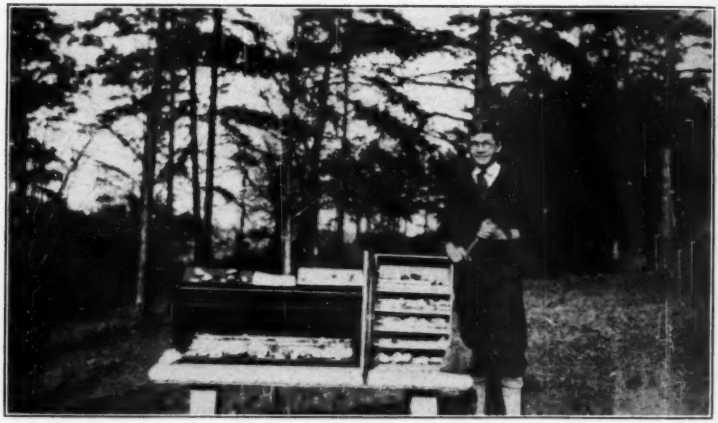
*Printed by the permission of the Director, Department of Mines, Ottawa, Canada.

Howard M. Irish, lapidary and gem cutter of Buckfield, Maine, recently purchased the world-famous Mount Mica gem mine as well as several other properties and mineral rights in his State. Mr. Irish is now in position to supply from his own holdings pollucite, lepidolite, precious tourmaline and beryl as well as feldspar and quartz—the latter two in carload lots.

Scapolite: Yellow scapolite has lately been discovered in Brazil. The material is of gem quality though of pale color. This mineral has heretofore been found only in Madagascar and in very small crystals. The Brazilian crystals are also small with one exception a large specimen which has been acquired by one of the most known precious stone dealers of the country.

Our Junior Collectors

Some Day They May Be Our Leading Mineralogists



You would smile too if you possessed Donald's fine collection of Minerals.

We take pleasure in introducing to our readers in this issue, Donald S. Fraser, of 145 Ivy St., Spartanburg, S. C. Young Donald is only 14 years old and keenly interested in minerals and in ROCKS AND MINERALS also and we could write a lot about him but we think it best for him to tell his story himself.

"When I first started collecting minerals I was at a summer camp in North Carolina—this was a little over two years ago. Although no interesting minerals were to be found near the camp, about nine miles away were two zircon mines which I visited and collected a number of good specimens while a field near the mines exposed a quantity of fine quartz crystals.

Not long ago a friend and I took our bicycles and we went off on a four day trip, rambling around the mountains hunting for specimens, going as far as Saluda, N. C. We procured a number of good specimens and enjoyed our trip very much. I am planning on making another such trip this year.

My collection now contains over 270 specimens and the specimens are all labeled, over 40 of these are semi-precious gems, and kept in a glass-doored cabinet which I built. I have installed my collection, along with a chemical laboratory and a model ship-making shop, in a room in the basement of our home."

Donald began to collect minerals before he was 12 years old and as the photograph shows he has a collection which any boy would be proud to own. Any boy can have a similar collection if he will give as much time and enthusiasm in gathering the minerals as Donald has.

We are very sure Donald would be delighted to exchange specimens with other young collectors and also tell them of his experiences in collecting minerals.

A choice "Cabinet" specimen. We wonder if Edward carried it home with him to add it to his collection.

Another young collector whom we are pleased to introduce to our readers is Edward Barone, a young boy scout, of 640 Forest St., Orange, N. J. Edward is also keenly interested in minerals but perhaps more so in geology. Another branch of study which Edward intends to follow is philosophy, combining this subject with geology and he would be glad to hear from any young collector who may be interested in either or both subjects.

In the photograph shown, Edward can be seen measuring a fossilized tree stump which was taken out of the Anthracite coal mines of the Lehigh Valley Coal Co., at West Pittston, Penn. Edward kindly sent us the following measurements of this interesting fossil stump:—

Height	26 inches
Diameter, top	21 inches
Diameter, bottom	31 inches

The other young scout in the picture is Louis Hauffe, a friend of Edward's.

The large building in the background in the picture is known as a "breaker", a plant in which anthracite coal is broken, screened and washed for the market.

FREE MINERALS FOR YOUNG COLLECTORS

H. N. McConnell of 211 Arapahoe St., Boulder, Colorado, will send free, to any boy or girl under 16 years of age, 12 Colorado mineral specimens, if they will meet the following conditions:—

1—Send a little note from your scoutmaster, teacher, minister, or priest, stating you are collecting minerals or wish to begin collecting.

2—Send enough postage to mail a two pound package from Boulder, Colorado, to your address; your postmaster will tell you how much this will be. The specimens are approximately one by one inch in size.

Editor's Note:—

Those sending for the minerals will be under no obligations to Mr. McConnell, nor will they be asked to buy anything.

The Mineralogy Club of the Northeast High School at Philadelphia, Pa., some 30-odd Members, had their first hike of the season, Wednesday, February 25th. A truck was hired and some 25 red-hot mineral hounds made the trip to French Creek where calcites, pyrites, chalcopyrites, magnetites, etc, were collected and for which this locality is especially noted. On the way back stops were made at the famous old Phoenixville lead and zinc mines where galena, sphalerite and pyromorphite are still to be found and at the Bridgeport quartz locality. All reported a very good time.

The 3rd Annual Mineral Exhibit and Contest for prizes was held at the High School last month (May). We hope to announce the winners in the next issue of the magazine. The Club has a membership of 100% in the Rocks and Minerals Association.

Interesting Localities and How to Reach Them

AN INTERESTING OCCURRENCE OF FOSSIL FISH

—*By*—

EDWARD C. FOSTER

Dept. of Geology, Clark University, Worcester, Mass.

Along the bank of the Connecticut River, about a mile north of the town of Sunderland, Mass., and along the road to Montague, one may collect fairly good specimens of fossil fishes. The site is located a short distance north of the old Whittemores Ferry, and can only be reached at low water.

The fossils are found in the black Chicopee shales, of the Triassic series. I have collected some very good specimens from this locality, yet I have never succeeded in obtaining a perfect fossil. Many have been found, however, and a good collection is on view at the geological museum of Amherst College. The fossils of this region belong to the ganoid class, which is almost extinct today, the only living relative being the gar pike.

Care must be taken in splitting the shale, and I have found that the use of a cold chisel is the most expedient method for extracting the fossils.

A curious phenomenon is noticed as one strikes the shale with a hammer. A peculiar bituminous odor arises, similar to that which arises from oil shale when struck with a hammer. In partial explanation of this I have advanced the theory that the decomposition of organic matter, principally from the fishes with some vegetal matter, has at some time produced crude oil which has since become disseminated throughout the shale, causing its black color and peculiar odor.

THE FOSSIL BANKS OF CHESTERTOWN

By JOHN G. LYMAN

If you are touring or happen to be in the vicinity of Chestertown, on the Eastern Shore of Maryland, it would be a good idea and would not take much time to visit the fairly well known "Fossil Banks" of Chestertown.

The Banks are about two miles from Chestertown, located right on the Chester River, an inlet of the Chesapeake Bay. Here you may find numerous specimens of many kinds of fossils. I have in my collection many interesting specimens from these Banks. There are also numerous specimens from this locality scattered around in the different museums of the country.

A Compilation of Gem Names

— *By* —

GILBERT HART
St. Edwards University, Austin, Texas

Mr. Hart and ROCKS AND MINERALS will be glad to have readers send in additional gem stone names not here included or suggestions as to any corrections in names which they believe should be made.

This is the final installment of the very interesting compilation of gem names (the largest ever printed) made by Mr. Hart, the first installment of which appeared in the December, 1927, issue of the magazine. This list is to be printed in book form in the near future.—The Editor.

Tasmanian Diamond—New name for Topaz—Submitted by P. Ormsby Lennon.

Touchstone—quartz, basanite.

Tourmaline—hexagonal, usually in trigonal prisms; color varies thru almost every hue, depending on composition; hardness 7 to 7.5, specific gravity 3.15; complex borosilicate. Gem names: **Achroite, Andalusite, Aphrizite, Blue Peach, Blue Schorl, Brazilian Chrysolite, Brazilian Emerald, Brazilian Peridot, Brazilian Sapphire, Ceylon Chrysolite, Ceylon Peridot, Chrome Tourmaline, Chrysolite of Brazil, Cockle, Dravite, Emeralite, Indicolite, Indigolite, Jet Stone, Peach, Peridot of Brazil, Peridot of Ceylon, Precious Schorl, Rubellite, Schorl, Siberian Ruby, Siberite.**

Trainite—variscite, impure and banded.

Traversellite—diopside.

Travertine—calcium carbonate deposited by springs and underground waters.

"Tree"—prefix signifying dendritic inclusions.

Tree Agate—quartz, agate with dendrites resembling trees.

Tree Stone—quartz, moss agate.

Tremolite—member of the amphibole group of silicates; monoclinic, massive; white to violet; hardness 5 to 6, specific gravity 3.00; silicate of calcium and magnesium. Gem names: **Calamite, Nephrite.**

Trenton Diamond—quartz, rock crystal from Herkimer county, N. Y.

Trilobite—a fossil crustacean occasionally used as a scarab.

Tripestone—anhydrite, concretionary in contorted bands.

Triphane—spodumene, yellow to greenish yellow.

Troostite—willemite, pink to gray or apple green.

Turkis—turquoise.

Turquoise—amorphous; massive; blue and green; hardness 6; specific gravity 2.83; hydrous phosphate of aluminum. Gem names: **Agaphite, Calaite, Celestial Stone, Chalchuite, Edisonite, Mineral Turquoise, New Rock, Occidental Turquoise, Odontolite, Old Rock, Oriental Turquoise, Rock Turquoise, Semi Turquoise, Turkis, Turtle-back.**

Turtle-back — chlorastrolite; (2) turquoise matrix, (3) variscite matrix.

Ultramarine—lazurite, lapis lazuli.

Unakite — epidotized granite, mottled green and pink.

Unionite—zoisite, very pure pink.

Unripe Diamond—quartz, rock crystal.

Ural Chrysoberyl—chrysoberyl, var. alexandrite.

Uralian Emerald—demantoid (andradite) from Siberia.

Uranotile—rare soft yellow uranium mineral, occasionally mounted in deference to its content of radium.

Utahlite—variscite, compact.

Uvarovite—member of the garnet group of silicates; isometric; duodecahedra; green; hardness 7.5; specific gravity 3.45; silicate of calcium and chromium. Gem names: **Chrome Garnet, Ouvarovite, Uvarowite.**

Uvarowite—uvarovite.

Valencianite—orthoclase, var. adularia.

Vallum Diamond—quartz, rock crystal from Tanjore District, India.

Variolite—orthoclase, dark green containing lighter colored globules.

Variscite—orthorhombic; massive; green; hardness 4; specific gravity 2.4; hydrous phosphate of aluminum; names for ornamental varieties: **Amatrice, Callainite, Chlorutahlite, Sabalite, Trainite, Turtle-back, Utahlite.**

Vegetable Fossil—amber.

Vellum Stone—quartz, rock crystal from Vellum, Madras, India.

Venus Hair Stone—quartz, sagenite, brown rutile needles.

Verd Antique—calcite marbles, clouded or veined with green and yellow, (2) serpentine, varigated, clouded, or mottled with green, white and red.

Verdite—a green rock composed mainly of fuchsite.

Verdolite—a breccia composed of talc and dolomite.

Vermeille—spinel, orange-red; (2) almandite, orange-red.

Vermilion Opal—opal, milky, impregnated with red cinnabar.

Vermilite—opal, vermilion opal.

Vesuvian Gem—vesuvianite.

Vesuvianite—tetragonal; massive; green; hardness 6.5; specific gravity 3.35; fluo-silicate of iron, calcium, and aluminum. Gem names: **American Jade, Brown Jacinth, California Jade, Californite, Colophonite, Cyprine, Egeran, Greenstone, Idocrase, Italian Chrysolite, Oregon Jade, Vesuvian Gem, Viluite, Volcanic Chrysolite, Volcanic Scoria, White Jade, Wiluite, Xanthite.**

Viluite—vesuvianite.

Vinegar Spinel—spinel, yellowish red, clear and transparent.

Violane—diopside, dark violet to blue.

Violet Stone—cordierite.

Violite—quartz; var. chalcedony, compact, purple.

"Volcanic"—prefix used with vesuvianite gems indicative of the vesicular character.

Volcanic Chrysolite—vesuvianite.

Volcanic Glass—obsidian.

Volcanic Lava—lava.

Volcanic Scoria—vesuvianite.

Vulpinite—anhydrite.

Wabanite—slate, banded in cream and black or purple and chocolate.

Wardite—an amorphous concretionary phosphate occasionally used as an ornamental.

"Water"—prefix used in connection with inclusions of liquid, or with water-like color, or indicating the resemblance of the gem to another when immersed in water.

Water Agate—quartz, var. chalcedony, containing water bubble.

Water Chrysolite—moldavite.

Water Opal—feldspar moonstone. (2) hyalite.

Water Sapphire—cordierite. (2) topaz, white.

Water Stone—opal, hyalite. (2) quartz, enhydrous.

Wax Agate—quartz, var. yellow agate with pronounced waxy luster.

Wax Opal—opal, yellow with waxy luster.

Wernerite—member of the scapolite group; tetragonal; usually massive or in prisms; pale colored; hardness 5 to 6; specific gravity 2.68; silicate of sodium, calcium, aluminum with chlorine. Gem names: **Glaucolite, Passauite, Porcelain Spar.**

White Agate—quartz, chalcedony.

White Carnelian—quartz, var. chalcedony, cloudy milk-white to very pale reddish or yellowish.

White Emerald—beryl, var. caesium beryl.

White Jade—nephrite, white. (2) garnet, compact, white. (3) vesuvianite, var. californite, white.

White Opal—opal, var. precious opal, light or pale colored.

White Sapphire—corundum, colorless. (2) quartz, colorless.

White Topaz—topaz, colorless. (2) quartz, colorless.

Wicklow Diamond—quartz, rock crystal from Wicklow, Ireland.

Willemite—hexagonal; usually massive; green to red, or white; hardness 5.5; specific gravity 4.18; zinc orthosilicate, also called **Troostite.**

Williamsite—serpentine, rich blackish oil green, may also contain black chromite to give mottled effect.

Wiluite—vesuvianite, green. (2) garnet, yellowish green to greenish white.

Wilsonite—scapolite, purplish red.
Wiserine—octahedrite, yellow.
Withamite—epidote, deep crimson or carmine red to straw yellow, very pleochroic.
Witch Riding Stone—quartz, flint.
Wolf's Eye—feldspar, moonstone.
Wolf's Eye Stone—crocidolite.
Wollastonite—member of the pyroxene group; monoclinic; massive; white to green or red; hardness 5 to 5.5; specific gravity 2.85; calcium silicate.
Wolyn—miner's term for barite.
Wood Agate—quartz, wood petrified or replaced by quartz.
Wood Opal—opal, wood silicified by opal.
Wood Stone—quartz, silicified wood.
Wood Tin—cassiterite, concentric structure.
World's Eye—opal, var. hydrophane.
Xanthite—vesuvianite, dark yellowish brown.
Xenolite—Sillimanite.
Xylopal—wood opal.
Yanolite—axinite, violet, a rare color.
Yellow Quartz—quartz, yellowish, pellucid.
Yellow Sapphire—corundum, yellow.
Yenite—ilvaite.
Yogo Sapphire—corundum, sapphire from Yogo Gulch, Montana.
Yu Stone—jade.
Zafirina—quartz, var. chalcedony, bright blue.
Zeasite—wood opal.
Zeolite—a group of silicates; often equal to hydrated feldspars, a number of related crystal groups, low in specific gravity and hardness; following are used as ornamentals: **Apophyllite, Mesolite, Natrolite, Thomsonite.**
Zeylanite—spinel, ceylonite.
Zincite—hexagonal; massive; red; hardness 4 to 4.5; specific gravity 5.5; oxide of zinc.
Zircon—tetragonal; usually in prisms; brown to yellow; hardness 7.5; specific gravity 4.68; silicate of zirconium. **Gem names: Azorite, Ceylonese Zircon, Hyacinth, Jacinth, Jargon, Jargoon, Matara Diamond.**
Zoisite—orthorhombic; massive; green to pink; hardness 6 to 6.5; specific gravity 3.38; hydrous silicate of calcium and aluminum. Gem names: **Rosaline, Saussurite, Thulite, Unionite.**
Zonite—quartz, var. chert or jasper, vari-colored in zones.
Zonochlorite—prehnite, banded, similar to or identical with chlorastrolite.

MINERAL LOCALITIES INFORMATION DEPARTMENT

Members desiring information regarding minerals or mineral localities in the following states may obtain it by writing to the Collectors listed and enclosing a self-addressed stamped envelope.

Oregon, Southern Idaho, Northern Nevada	Dr. Henry C. Dake, 793½ Thurman Street, Portland, Ore.
The Oregon Coast, South and Western Oregon, Northern California, Southern Washington	John M. Tracy, 601 Orange Street, Portland, Ore.
Petrological Information in Central Eastern Iowa	Prof. Wm. J. H. Knappe, Curator, Wartburg College Museum, Clinton, Iowa.
Massachusetts	Edward C. Foster, Department of Geology, Clark University, Worcester, Mass.
Pacific Southwest, especially Southern and Central California	Edwin V. Van Amringe, Department of Geology, Pasadena Junior College, Pasadena, Calif.

Bibliographical Notes

The Minerals of New York City and Its Environs, by James G. Manchester, 325 pages, (127 plates and one map), has just been issued as a "Bulletin" of the New York Mineralogical Club and is the result of years of painstaking effort on the part of that enthusiastic and energetic student of mineralogy, Mr. James G. Manchester. As a record of many years of collecting and trips taken within the area embraced in a radius of fifty miles of Columbus Circle, New York City, it leaves nothing to be desired. When one realizes that in this territory is included places such as Franklin, Paterson, Great Notch, Tilly Foster, Branchville, Chimney Rock and Beemerville, it is not really surprising that Mr. Manchester is able to list such an extensive variety of minerals, to which there is probably no parallel in the entire country.

There are 88 excellent plates illustrating notable mineral specimens, many of which are unique in quality and beauty. The 46 plates of mines, quarries, excavations and groups of members on trips, dating back to 1887, will unquestionably make an appeal to the enthusiast, to whom the pleasure of a mineral trip has few counterparts. This book should be owned by every collector as it is a valuable reference work with its lists of minerals and complete data arranged three ways: by localities, alphabetically and according to Dana.

Fifty pages of text, in clear type, contain much information on minerals found, geology and localities of the area treated, making pleasant reading of interesting and valuable facts. Moreover, Mr. Manchester's splendid work is of strong interst to the amateur as well as to the professional mineralogist and cannot fail to produce a wonderful tonic effect on the enthusiasm of the former, particularly.

Copies of the book may be obtained at $2.50 per volume plus postage, by applying to New York Mineralogical Club, American Museum of Natural History, 77th St. and Central Park West, New York, N. Y.

HARRY W. TRUDELL.

City Tunnel No. 2—A Deep Pressure Tunnel for the Delivery of Water in New York City—Description and Construction Methods: By Harry Bouton of the New York City Board of Water Supply. An article which appeared in the Municipal Engineers Journal, Vol. 16, Fourth Quarterly Issue, New York, N. Y. This describes the $64,000,000 project now in process of construction, a twenty-mile tunnel to carry water from Hillview Reservoir in Yonkers, to Queens and Brooklyn. The article gives exceptionally complete descriptions of caisson sinking and tunnel construction and a short but clear explanation of the geological features involved, and is profusely illustrated with maps, drawings, and photographs. T. W. F.

Biographical notices of mineralogists recently deceased (Fourth series): By L. J. Spencer, M. A., Sc. D., F. R. S.; Keeper of Minerals in the British Museum (Natural History); Honorary Life Fellow of the Mineralogical Society of America; Ehrenmitglied Der Deutschen Mineralogishen Gesellschaft. (Reprinted) from the Mineralogical Magazine, December, 1930, Vol. XXII, No. 131, pp. 387-412.)

The pamphlet lists alphabetically 40 noted mineralogists of the world, recently deceased, with a biographical sketch for each.

Published by Mr. Humphrey Milford, Oxford University Press, Amen House, Warwick Square, London, E. C. 4, England.

The Sundial: Published by Julian M. Field, Payette, Idaho, is a little eight-page magazine issued in the interest of the amateur naturalist, It is an attractive publication, with many illustrations. Mr. Field, the Editor, is a mineral collector and we are very sure that interesting articles on mineralogy and geology will appear in **The Sundial** from time to time. We extend to **The Sundial** our best wishes for a bright future.

The magazine comes out monthly and the subscription price is 50c per year.

Scientific Apparatus and Supplies—Catalog No. 35. A catalog comprising 128 pages with many illustrations featuring laboratory supplies and equipment carried in stock has recently been issued by Standard Science Supply Co., 400 W. Erie Street, Chicago, Illinois.

Device for Estimation of Density of Gems and Small Amounts of Solids—by Eugene W. Blank. In the Analytical Edition of **Industrial and Engineering Chemistry**, Vol. 3, issued January 15, 1931, was an interesting article on the determination of the density or specific gravity of small amounts of solids too minute to be determined by the more usual methods available. The device described by the author is particularly adapted for the determination of the density of extremely small quantities of substances, cut gems, and small mineral crystals or fragments.

The Sluice Box

—— *By* ——

A. RIFFLE

A pair of tourist "Newlyweds" stopped over in the Village for some repairs to their car and while here they wandered into the hills with a 22 rifle and came back proudly displaying a prairie dog, evidently the first of its kind that either of them had ever seen. Old Bill was working in his garden and they stopped and plied him with questions as to the life and habits of their victim. Finally the groom said, "Are they good to eat?" "Sure," said Old Bill, "but only if you cook them with bacon." Said the bride, "How do you prepare them?" Old Bill gave her detailed instructions. "Skin and dress it carefully, put it in a pan of cold water with a little salt and set it in a cool place. Cut about a quarter pound of bacon into thin strips. Get a hot fire going and fry the bacon crisp. Put the bacon on the table and feed the prairie dog to the cat."

These days when everyone is concerned about investments and budgeting expenses the mineral collection is apt to be looked at with misgivings and the specimen appropriation trimmed down severely if not eliminated entirely. Let us do a little figuring and maybe we will get a new light on that subject. Assume a $20.00 expenditure for specimens this summer by a collector who can look forward to twenty more years of normal life expectancy. That money is not spent, it is invested in real enjoyment, better education and greater cultural achievement and is costing him not $20.00 for this year but $1.00 a year for twenty years and that is not taking into consideration the probable sale value of the specimens when the purchaser is ready to part with the collection.

Do a little figuring and you will most likely find that no other investment pays you any greater dividends than your minerals even though those dividends are not in cold cash. Times are hard and all of us know it. But surely there are many other things that you can better forego than your usual or at least part of your usual expenditure for mineral specimens. Dealers in minerals are like other merchants and you will no doubt find that lower prices are the rule in minerals as well as for other merchandise. So maybe this is just the time when you can not afford NOT to buy specimens.

Fifty-two pages and cover in the March issue of ROCKS AND MINERALS and not a dull paragraph in all of it. Take this copy and a few subscription blanks with you if you go on a trip this summer. There are many prospectors and mining men and probably a number of collectors who have not yet heard of ROCKS AND MINERALS and many of them will be glad to subscribe and thank you for bringing it to their attention. Anyway, pledge yourself to get one subscription this summer.

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Organized to stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not as yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

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A NEW ADVERTISING POLICY

Beginning with the September number, ROCKS AND MINERALS will introduce a new advertising policy—No advertisements from unknown parties will be inserted in the magazine until such parties first give us some assurance of their reliability (bank references especially will be requested.)

We hope by this means to keep out all unscrupulous dealers and those "collectors" who make a practice of fleecing others with fraudulent sales or exchanges.

We are sure this policy will be heartily endorsed by our readers and subscribers and we also believe that from now on it will be a mark of distinction for any dealer to have his copy appear in ROCKS AND MINERALS.

This is just another step toward making ROCKS AND MINERALS *a better and a finer magazine on minerals.*